



FRIDAY, MARCH 29, 1878.

Railway Advertising.

The following is the text in full of the address delivered at the late meeting of the General Passenger and Ticket Agents' Association at Jacksonville, Fla., by Mr. George H. Heafford, General Passenger Agent of the Missouri Pacific Railroad. Only a brief mention of it was made in our report of the convention two weeks ago:

MR. PRESIDENT, LADIES AND GENTLEMEN: I feel a good deal like the boy who, when called upon to write a composition, started out bravely on the subject of "The Horse," but after saying, "The horse is a noble animal," found himself at its wits' end to know what else to say, and finally gave it up in despair.

When I was selected "by a large majority" to deliver the address at the next meeting of the General Ticket and Passenger Agents' Association, I thought I might be able to do partial justice to the topic of "Railway Advertising," but the more I thought of it the less I seemed to know about it, and I feared I should have to give up the subject and take up something more easy—such simple topics as "Commissions on Ticket Sales," "How to Cut Rates," or "The Best Plan for Increasing Expense Accounts of the Traveling Agents," etc., but I finally concluded to hold on to the first thought, and "do or die." If I fail in this, my first undertaking, it won't be because I have not tried hard enough.

Railway advertising may be divided into three classes—good, bad and indifferent. The good consists in knowing what to do, how to do, and when to do. The bad consists in an utter lack of all those qualities, and the indifferent is naturally a combination of both good and bad. This may not be logic exactly, but it looks and sounds well.

When Jason started out several years ago, in his schooner-rigged "fore-and-aft," to hunt the Golden-Fleece, ancient mythology does not state that he advertised the time of his departure from Jacksonville, nor that the "band would continue to play" on the Fall River Line boats, hence I consider that the "half-sheet card" and "bulletin board" advertising is of a somewhat recent date.

I should have stated before this that the careful reader of Chambers' Encyclopedia will have probably noticed that its explanation of the word "advertisement" is about as follows:

"Advertisements by public carriers, railway companies and the like are equivalent to offers whereby the advertiser will be bound to those who send goods (or are the passengers) on the faith and in accordance with the terms of the advertisement."

In most of the railway advertisements I have ever seen, I have noticed that the companies generally offer to carry the passengers according to the terms stated therein, and they have actually been known sometimes to fulfill their agreements. I remember once, in the Union Depot at Atlanta, I fell to studying the glowing "half-sheets" and "dodgers" of the various lines posted on the walls, and I found that one read: "This is the shortest line to New York city;" the next stated that "by taking this route passengers will save eight hours in time to New York and all Eastern cities;" while a third one claimed "that this is the shortest, quickest, best and most direct line to New York and the East," and I suppose if Capt. May ("the subscriber") had been there he would have tackled one up combining all these specialties, including the fact that "his road" was "inlaid with dormicks and ran all the way in the shade." The moral of all this would seem to be that if railway companies advertise at all, it should be done in such a way that the public mind should not be misled—in other words, the "truth should be stated at all times and in all places."

To a great extent the railroads have been the means for the advancement of civilization throughout the world, and may fairly be called *educators* in various ways to the public at large. Among other things, it may be cited that of late years the publishing of maps of the various lines has become an important adjunct to the mere matter-of-fact advertisement, and I have no doubt that to the members of this Association may be accorded the distinguished honor and credit of promoting among the people of the United States and New Jersey—especially New Jersey—a more universal knowledge of geography than any other class of instructors.

If this world could be made over according to some of our ideas, I have not the faintest doubt but that the railroads we represent would all be the straightest and shortest lines between every prominent city in the country, in which case all "through rates could be made up on the sum of the locals," and no limited tickets would then be needed, for the genius scalper would, like Othello, find his "occupation gone;" "justice would then triumph, and virtue reign supreme." (If any of my quotations be not found strictly correct, I refer to Mr. Charlton as my authority for the version.)

As an instance of the good which results from the truthfulness depicted in the ordinary railroad map which we frequently find posted on the out-houses, dead-walls, and fences of our large cities, I may be permitted to relate the following: When the Erie & Chicago line was first started, it ran from Chicago via Cleveland and Salamanca to New York city, and its enterprising managers got out large posters depicting the route of the line in the broadest band of the blackest ink, and placing the names of such towns as Chicago, Cleveland, Salamanca and New York city in letters so large that he who ran might read, but at intervals of about six inches apart and upon nearly the same parallel of latitude. One bright day four gentlemen of the Celtic persuasion, attracted by the appearance of the map stretched outside of the Chicago office, called upon the gentlemanly agent of the afore-said line and desired to know the price of second-class tickets to New York, and were informed that the fare was \$20 or thereabouts (I don't remember the exact figures), which seemed to stagger them somewhat, and after some little consultation among themselves they went outside and recommended the study of that wonderful map. By means of a foot measure and the use of their knowledge of that mathematical term known as an "unknown quantity," they discovered that Chicago and Cleveland were only about four miles apart, and that the other stations named were about similarly placed as to distance, and the final conclusion of the party was summed up by the leader thereof with the brief and decisive remark: "Be jabbers, it's not far, let's walk!" and they may be walking yet for all that I know.

Truth is said to be stranger than fiction, but whether the story be true or not, I cannot state of my own free will and accord.

The precise chronicler of these facts about advertising should not fail to pay his respects to the bulletin board, the acme of railroad advertising enterprise at a period of about ten or fifteen years ago, but now nearly obsolete, and looked

upon, like Cleopatra's Needle, as a relic of bygone days, or as Mark Twain or the obituary poet of the Philadelphia Ledger might say:

Gone, gone, gone with care,
Gone with thankless wear and tear;
Gone from the presence of the passenger.

No cards.

What beautiful relics of the semi-barbaric age they were, with their gold-tinted and polished black walnut frames, and their magnificently painted glass signs with the Star of Empire wending its westward way wherever it could be put in, or with the Eagle of Liberty holding numberless arrows in its talons, sprawling all over the top of the board.

More hearts have been broken, more coats have been bursted, more trousers have been ruptured, and more imprecations have been uttered by traveling passenger men in selecting the best places, and hanging those wonderful works of art in reading-rooms and bar-rooms of hotels, than ever mortal passed through in any other line of business. Even that difficult task of putting up a stove was nothing compared to it.

Common sense began to be exhibited when the era of small frames, just large enough to take in a half-sheet card, came into existence; but those have virtually had their day, and the half-sheet card itself with its staring head lines and its immense amount of printed matter—seldom if ever read by any one but the progenitor thereof—will soon pass away, and new ideas will have to be developed and brought forth.

For the benefit of the printer (whose affection I still hope to retain), I desire to say that for a while, at least, I think a small number of half sheets should be printed and distributed about twice each year, but such advertisements should be briefly worded and simply intended to keep the name of the road before the public, and to gratify the eyes of our Directors or Managers who authorize the payment of bills for the outlay.

As to the actual benefit to accrue to a road by such advertising, I think nearly all of you will agree with me that it amounts to nothing. It is a well known and well proven principle that "good advertising pays," and railroad companies can be materially benefited and irretrievably injured, according to the kind of advertising they indulge in.

To my mind there are but two ways of properly advertising a railroad, and they are:

First, by judicious advertising through the columns of widely circulated newspapers of undoubted character and intelligence. I do not mean that it is necessary to insert a long display card in the ordinary advertising columns of the paper, to be continued the whole year round without a change in the wording thereof, but I mean that short notices of from five to ten lines each should be inserted in what is termed the local or reading columns of such papers, to be changed frequently, or by having them published for one or two consecutive issues, at such seasons of the year as the business may require.

Such notices should not be paid for in passes, mileage or free tickets of any description whatever, but paid for in cash at the regular advertising rates, or at such a reduction on the card rates as may be granted to other persons who advertise in a similar manner. By doing this, we can feel more at liberty to refuse to grant the "courtesies of the road" to editors and publishers; and two years' experience of this policy on the line of road I represent has proved it a success. If we then choose to grant a complimentary free or half-fare ticket to an editor for the purpose of a special trip over the line for his own recreation, or for the purpose of "writing up the road," we can do it without incurring the ill-will of other less favored "Knights of the Quill and Scissors."

Second, and last, but not least, good traveling passenger agents, who solicit business and distribute thoroughly, yet judiciously, such advertising matter as map folders and time-tables, small dodgers or streamers, or such other like specialties, gotten up in a neat, readable and attractive style, are, to my mind, the best means for advertising a railroad can have; and while I consider it the duty of each and every one of us to curtail the expenses of the passenger department wherever possible, I think we should endeavor to make our managers comprehend the efforts of these men in order to secure business, and try to have them peculiarly rewarded according to their ability and faithfulness.

While I might be glad to continue this subject indefinitely, my natural modesty forbids me to further encroach upon your time; and as I find that there are about two hundred talented members of this Association who will have a chance and are anxious to address you before my turn comes round again, I will "eliminate" any further remarks on this topic, and if I have left out anything that I should have said, I am perfectly willing to be forgiven for it.

Decisions of Traffic Questions by the British Railway Commission.

We give below a part of the report of the British Railway Commission for the year 1876-77. The rest of it we have published heretofore; the part preceding on page 101 of this volume (Feb. 25), and the part following that now published on page 119 (March 8).

14. It is well known that the charges which a company may take must not exceed the maximum tolls authorized by its special act. It has been less noticed that they must also be reasonable, and even where a company is empowered to charge any rate it thinks proper; as for the carriage of packages not exceeding a certain weight, generally five hundred weight, the power is not absolute; the charge must still be a reasonable sum. We have had from time to time complaints made to us of high charges on local traffic, and it deserves consideration whether it would not be well that this important statutory qualification of reasonableness were made of practical value, and security taken for its being observed, by our being authorized to enjoin the reduction of unreasonable charges, just as we enjoin the reduction of unequal charges. As to that portion of the traffic of a line which is through traffic, or traffic to or from other lines, the right does not exist of requiring a company to forward at less than its maximum rates. Railways in this country are so connected, and are so largely employed for through traffic, that it was found that so necessary an element of unimpeded transit as through rates could not safely be left to the accident of no question (whether of amount or apportionment or route) arising to prevent their being established by agreement between the companies interested. That there should be means therefore of establishing through rates, in spite of any disagreement, was recommended both by the Royal Commission of 1865, and by the Joint Select Committee on Amalgamation in 1872, and the act passed the following year carried this twice-made recommendation into effect, and by its eleventh section every company has a right to propose through rates over the lines of other companies, and failing their consent to the rates proposed, to refer to us to allow and apportion them at our discretion. We have seen it stated here and there that this right is fraught with possible danger to railway property. But certainly as yet it has done no harm, nor developed any tendency to do harm; rather it has been of excellent effect as an additional motive to harmony of arrangements, and an additional motive to connected companies to act as one concern in providing for the forwarding of through traffic. At

the same time the power we exercise in this matter is clogged with some restrictions, which would be better removed, and of course a power that can only be exercised at the instance of a railway company is of no help in cases where the interests of railways and of the public are different—cases, that is, where the public desire lower aggregate rates than any company is in favor of or is willing to propose to other companies. One of the restrictions to which we allude is this, that if it is referred to us to allow or refuse a through rate, and the amount of the rate is the point to which objection is taken, we have no alternative to simply granting or refusing the rate as proposed, and are without power to fix an amount for it different from that which has been proposed. We are authorized to make any division of a rate we please, but if we grant the rate at all we must grant it at the amount as a whole at which it has stood in the notice given of it by the applicant company to the other companies. We would suggest that we should have the same power over the amount of a through rate that we have over its apportionment. There is also one extension of the principle of the act which we think should certainly be made, and that is, that all lines which have been subject, *inter se* to the right over them given by that act, should continue subject to it, notwithstanding they may pass by amalgamation or working arrangements under the control of a single company, and as to the party to put the right in operation, we would advise that in such cases it should be made capable of being used at the instance of the public or the senders of goods.

15. The Newry & Armagh Railway Company v. the Great Northern (of Ireland) Railway Company (Appendix No. 7), was an application to us to allow a deduction off the through rates, which the two companies had made with each other, of one halfpenny a ton a mile on all traffic in owner's wagons. The ordinary mileage rate as between railway companies for the use they respectively make of one another's wagons is one farthing and under, and as private wagons could not be run at that rate without loss, and the Newry & Armagh Company wished to be able to offer sufficient inducement for traffic to be sent in such wagons, they proposed this special mileage rate of one halfpenny. They had not, it appeared, a sufficient amount of rolling stock for the traffic they had to work, and were not in a position to add at once to the number they possessed. Their plan, therefore, was that traders should find their own wagons, and that the cost of thus supplying the deficiency should be met by reduced through rates; the reduction to be effected by allowing a halfpenny per mile for the use of the wagons, and the allowance to be payable by the companies over whose lines the wagons might be sent in proportion to distance run. The Newry & Armagh line being only a short one, by far the greater part of the extra mileage would have been payable by the respondents, but as they were not responsible for the inability of the Neath & Armagh Company to properly stock its own line, we refused the application.

16. Canals are able to compete with railways in the carriage of sundry classes of traffic, and railway companies have had recourse to various means to interfere with the independence of canals, and to obtain control over them. Many railway companies are canal companies as well, and own canals which are portions of a continuous navigation, and it was quite necessary that their policy as railway companies to prevent, by high tolls, the carriage by water of competing or through traffic should be met by independent canal companies having a right to call upon them to agree to through tolls. The case of the Warwick Canals (Appendix No. 14) was a through rate canal case, and, being the first of the kind we have had, it gave rise to many questions, discussed elaborately and at great length, as to the reference of the through rate system to canals, and the proper construction of section 11 of the Act of 1873. The Warwick canals, and the canals of the Birmingham, the Oxford, the Grand Junction and the Regent's Canal companies formed together a continuous route by water from South Staffordshire to London; but the tolls on some of the canals made the route, as compared with the railway, too expensive a one for through traffic going the whole distance. Thus the charge of the Regent's Canal on through traffic to or from the Grand Junction was 9½d. a ton. Thus, too, the Birmingham and Oxford canals, between which the Warwick canals were placed, had each a bar toll on barges entering or leaving, and the Birmingham Canal, which was under the control of the London & North-western Railway Company, had mileage tolls in addition for through traffic. On the Oxford Canal the bar toll was in lieu of mileage, but it was a toll which averaged 4d. a ton, and this amount it was thought was unduly high, considering the small portion of route which was Oxford Canal, a nominal 7 out of more than 100 miles. It was vain for the Warwick canals or the Grand Junction Canal to reduce tolls on their own parts of the system so long as high tolls were maintained on other parts, and it was seen that only through tolls, in which all separate tolls should be comprehended or merged, would be effectual, being, in fact, regulated with reference to what competitive traffic by canal could afford to pay, and by the standard of the charges by railway; and they further proposed that these tolls should be divided in proportion to mileage, subject to a short-distance charge as a minimum. After hearing all objections we allowed the rates, but we varied in some respects the apportionments in a manner favorable to the Regent's Canal Company and the Oxford Company, in consideration of circumstances entitling them respectively to rather more than their share by mileage. We have made mention of many questions having been raised in this case as to the eleventh section being applicable to canal companies, and as to the construction of its provisions. With all these we dealt in our decision; but some that had been raised by the Birmingham Canal Company, came again before us on an application from that company for leave to appeal upon them as questions of law. Part of their application failed, but we granted a case as to three of their contentions, namely, first, that not being carriers on their canal they were not within the scope of the eleventh section; (they admitted that the Traffic Act of 1854 applied to both carrying and non-carrying companies, but they contended that section 11 of the Act of 1873 was narrowed by its wording to companies acting as carriers); secondly, that because there was another line of communication besides the through route, and they had a part also of such other line, and were charging certain tolls per mile upon it, therefore we could not allot them any less amount per mile out of the rates which we granted for the through route; and, thirdly, that their bar-toll was a special charge, originating in agreement, and that as such it was excepted from the charges which were liable to be superseded by a through rate.

17. The Great Western Railway Company are the proprietors of the Bennet & Avon Canal, and in the Wilts, Somerset & Berks Canal Traders' Association v. the Great Western Railway Company (Appendix No. 5), the amount of their canal tolls as compared with the rates at which they carried by railway was the matter complained of, and as we had power by statute to deal with the tolls as we might think fit, if they were not equitably adjusted to the cost of railway carriage, the traders by the canal applied to us to lower them. They showed that the toll on such articles as flour, grain, iron, malt, meal, ores of metals, salt, slates, timber and coal was one penny per mile, and that the competitive railway rates did not average twopence, and we made an order in respect of the articles

specified that the toll should be reduced to a halfpenny, which we thought sufficient payment for the use of the canal when the charge by railway which included conveyance was under twopence. We considered also that as the railway rates were less in proportion for long than for short distances, so it should be with canal tolls, and though the penny per mile toll was subject to a maximum of six shillings, that for a canal of sixty-eight miles in length was practically no limit, and accounted for the canal not competing with the railway for long distance traffic, and having, in fact, none; and we fixed the maximum charge for coal, as also for stone and tiles, at 1s. 6d., and for the other articles at 2s.

18. The same railway company were again the defendants in another canal case, Foster and another v. the Great Western Railway Company (Appendix, No. 4). There it appeared that since 1875 nothing had been done to maintain the Upper Avon Navigation in repair, and that boats could no longer use or navigate it. The great Western Company had for many years collected the tolls, repaired the works, and managed the navigation by the same officer who was the manager of their Stratford-on-Avon Canal, and there was evidence to show that in 1860 the navigation had been acquired in their interest as a feeder to their Stratford Canal. By statute 36 and 37 Vict., c. 48, every railway company owning or having the management of a canal is obliged to keep it in an efficient state of repair, and in good working condition, and the applicants claimed that the company should be enjoined to act conformably to the law. The company, however, denied that they had ever been the real owners of the navigation, and on this question of fact more evidence of ownership than we had was, we thought, requisite for the purpose of holding the statute to apply. They had also ceased at the time of the complaint to be a company having the management of the navigation. They had decided in June, 1875, perhaps in view of the new act, that they would no longer collect or receive tolls or continue to manage, and assuming they were not owners, we thought it was competent for them to relinquish the management, and that the steps they had taken with that object were on the whole sufficient to exempt them from the operation of the act.

19. In consideration of the working of the Traffic Act of 1854, and the subject of how and by whom proceedings are taken, we do not observe many cases in which only one person is complainant. Litigation of any kind is an inconvenience and an expense, and litigation with a railway company, whose resources may make it costly, even though costs are in our discretion, is not readily engaged in by a person separately, unless it may happen, as in some cases of undue preference, that his interests in particular are affected. If his ground of complaint is a want of due facilities or of reasonable accommodation he has to show that what he asks for himself is less required for the public convenience, and he naturally thinks that an accommodation which will be of general benefit should be obtained at the suit and risk either of some one representing the public, or of several persons acting jointly, rather than at the suit and risk of an individual. Thus the law remains without effect just where it would be of most advantage that it should be enforced. This was not unnoticed at the time of the passing of the Act of 1873. It was perceived that the public rights under that Act and the Act of 1854 would not be sufficiently guarded if we should not be able to exercise our jurisdiction to oblige railway companies to perform their duties, except upon complaints instituted and prosecuted by private parties, and it was provided therefore that an officer of the Board of Trade might act for the public, and might, upon the Board's certificate, take proceedings before us. Up to this time no use has been made of this form of procedure, and we recommend that, as another means of carrying its principle into effect, the certificate entitling and requiring the officer to act should be one that might be granted not only by the Board of Trade, but by ourselves as well. The issue of a certificate must be founded upon some preliminary inquiry, and it would not be difficult for us to deduce from a statement and answer whether the case is a fit one to be taken up on behalf of the public, and whether *prima facie* the facts alleged on either side afford a good cause of action or an adequate defense. The course would then be that wherever the public interest was affected any one would be at liberty to complain to us, and if the affidavits filed in support of the complaint appeared to us to disclose a sufficient case, and if also we were satisfied upon the point of public interest, we would issue a certificate, substituting the public officer for the party who had complained, for the further proceedings to be taken to prosecute his complaint, and to enforce the law.

The Tanite Company's Car-Box Grinding Machine.

This machine was designed for grinding car-boxes by means of an emery wheel, with perfect accuracy, and so rapidly and cheaply that boxes finished in this way would be very little more expensive than the rough castings.

The face of the emery wheel, *W*, is first turned with a diamond tool, to correspond exactly with the axle. This is accomplished by removing the frame *I*, which holds the boxes to be ground, from the rods, *K*, and substituting the frame represented in the cut at the right of the machine, to which a diamond, *A*, is attached. The diamond is first set in contact with the steel disc *B*, which exactly corresponds with the diameter of axle which the boxes are to fit. The wheel *B* is then removed and the diamond is brought in contact with the emery wheel *W*, and by means of the *T* lever, the diamond is made to describe an arc over the face of the wheel, making it correspond exactly, as will be seen, with the axle. The wheel once turned to proper shape is not likely to require frequent truing, as the motion is automatic and the wear upon the wheel so even that it keeps its shape well until worn out.

The boxes are quickly and accurately centred by being laid upon the bearing, *D*, of same size as axle, in the frame *E*. The clutch, *C*, is then placed over the frame *E*, and by means of the lever *F* the box is clamped accurately in position by

adjustable jaws. The clutch is then placed upon the carriage *I*, which has backward and forward motion communicated by the crank shaft *J*.

The feed is regulated by the hand wheel, which elevates or depresses the pillars which support the rods *K*, and is prevented from being too rigid by springs in the carriage *I*.

By using two clutches the operator can get a second box clamped and ready for the machine while the first one is grinding. A skillful operator can in this way, it is said, finish from four to six hundred brasses a day, at a cost of from fifty cents to one dollar per hundred.

The machine is 36½ in. high from floor to centre of arbor, and occupies floor space about 3 by 4 ft. It has a 2 in. steel arbor with 8 in. bearings, and carries a wheel 24 in. in diameter.

It is very heavy and substantially built, and runs smoothly without jar or chatter.

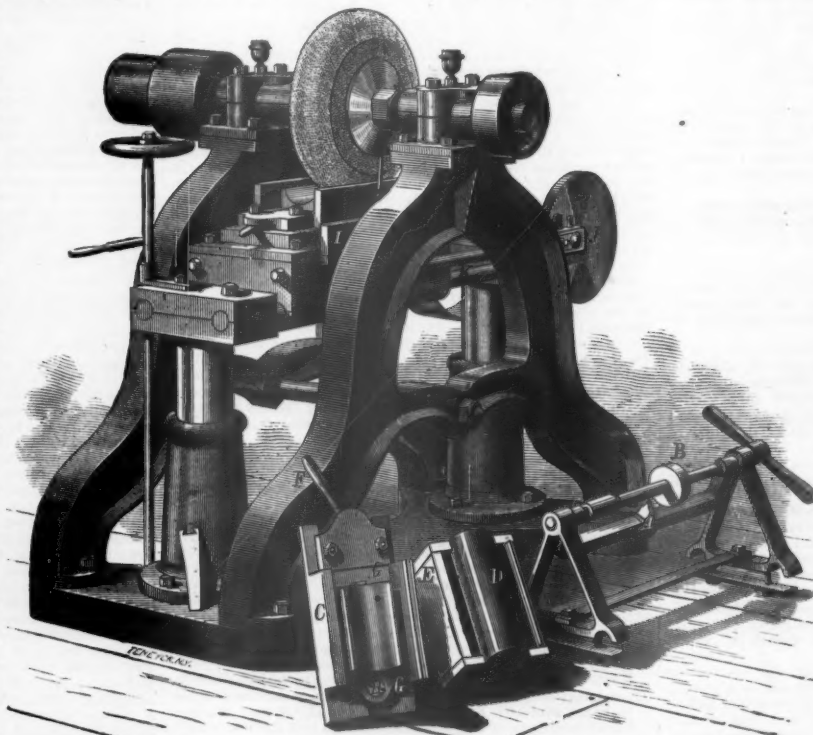
The prominent features of this machine are covered by letters patent to The Tanite Co., of Stroudsburg, Monroe County, Pa., to whom communications should be addressed for further particulars.

Contributions.

The Missouri Law Regulating Rates.

TO THE EDITOR OF THE RAILROAD GAZETTE:

An article with the above caption appears in your number for March 15, as copied from *The Public*. This article has your editorial indorsement in the following language: "It



THE TANITE COMPANY'S CAR-BOX GRINDING MACHINE.

carries the more weight because the editor of *The Public* was long a resident of Missouri and made a special study of the transportation question." Your indorsement is the cause of this response.

The article itself is a diatribe of senseless gabble, in which the author mixes up "1837, '45, '51, ten cents a mile, owl stupidity, law suits, donkey legislation, railroad commissioners, and 49 railroad charters" in a manner perfectly horrible to his diseased imagination. He evidently undertook to cram himself with the railroad charters of Missouri and swallowed 49 of them, when his sickly gastric organs refused any more aliment of that sort, and the sight of some hundreds more, which he could not possibly masticate, much less digest, created a most terrible nausea, and behold the result. Truly, "A little learning is a dangerous thing," especially to weak stomachs.

For the benefit of such of your readers of your valuable paper as may be seduced by your indorsement to give credence to this nonsense, I desire to say that the people of Missouri have proven their loyalty to railroads by most substantial, liberal and generous acts. They granted every charter and nearly every subsidy asked for, until over \$50,000,000 of their own means had gone into them. But when, after the crash of 1873 had stopped railroad building, they found that they had 3,000 miles of railroad which could not possibly have cost over \$100,000,000, of which they had furnished the half, and that the other parties, who had been allowed to acquire the ownership, instead of putting in any money of their own had mortgaged the property to raise it, and that, too, not only for the necessary \$50,000,000 but for \$100,000,000, they naturally became reflective and observant. "They wanted to know, you know," and they discovered that one road on which they had furnished all the means for its complete construction, had been mortgaged for over \$30,000 a mile. This is one specimen of a class. But the people consoled themselves with the reflection that they had the best end of the bargain anyhow, for the roads were there and they would have the use of them. But in some instances where the interest charges

against the roads were so great that they could not be met with ordinary transportation charges, the rates were put up so high that the people had to abandon the railroads and take to the old dirt roads again. Then the case became a hard one.

But another case was discovered in which the people had paid \$20,000 a mile in good county bonds, bearing 8 per cent. interest, always punctually paid, for the construction of a road which has never been completed and probably never will be. This is a specimen of another class embracing about 800 miles of unfinished lines, and to make the matter worse, in that half of the State where most of these unfinished lines are situated we already have a mile of railroad to every 14 square miles of territory and every 400 inhabitants. The unfinished roads must therefore remain so, for this generation at least.

A careful review of the situation revealed this state of things: No roads were paying dividends on their stock. A few were paying all the interest on their debts, many were not, and some paying nothing. Transportation rates were high, and held so, while the market value of products was rapidly falling. When the hog crop got down to 3½ cents a pound, it paid the same transportation charge as when it stood at 10. Debts do not shrink. The interest charge on the roads had not diminished with the diminished ability of commerce to pay it. Production was discouraged, shipments were falling off and the receipts of the roads declining. All parties were suffering, and it was thought that all should make some sacrifices for the general good. As yet the railroads had made none, although more interested than any other class, because their value depends entirely upon the prosperity of the country through which they run. While commerce, without thriving, can live without a railroad, a railroad cannot live without commerce.

The people, therefore, through their General Assembly, enacted a law limiting rates on passengers and a few staple freights, and creating a Board of Railroad Commissioners to take charge of these most important and at the same time intricate and delicate matters. The Commissioners elected at the last general election are all men of the strictest integrity, the widest intelligence and the highest standing in the community. One is a civil engineer, who has spent 20 years in the location, construction and operation of railroads; another is a graduate of West Point who has held honorable military rank in his country's service, as well as sundry civil positions, without a blemish upon his name; and the third was reared a farmer, trained as a merchant, and is the owner and manager of extensive agricultural interests, who loads trains of cars with the products of his own soil, who has made the subject of transportation his special study, and understands it as well as Charles Francis Adams or Albert Fink.

Surely in the enactment of this law and the selection of such men to watch over the railroad interests there is no evidence of hostility to those interests. And there is no such hostility in the hearts of the people. Whenever an antagonism has shown itself, it has been elicited by just such rabid, senseless and wanton vituperation as the author of the article in question exhibits.

ST. LOUIS, Mo., March 20, 1878.

[We do not see that *The Public's* article calls for any such criticism. The "senseless and wanton vituperation" seems to be in the above comment, rather than in the article which called it out; unless, indeed, it may be considered irreverent in Missouri to speak slightly of the dignitaries who make the laws of that state. If that is true, it is an exception among the states. *The Public's* article called attention to the fact that most, if not all, the Missouri railroads have contracts with the state which permit them to fix their charges; it concluded therefrom that the law limiting rates would be inoperative in most cases. Knowing the editor to be exceptionally well informed as to Missouri railroads and railroad laws, and therefore likely to give correct information concerning a subject which interests many of our readers, we copied his remarks. We did not lay much stress on his statement that the members of the Missouri Legislature that passed its railroad law were "considerably more ignorant than legislators of like temper in other Western States;" we do not well see how that could be. Probably a too exclusive observation of the Missouri variety of the animal has led the writer in *The Public* to cherish the delusion that it only possesses those qualities in the superlative degree; while they are common to the species, and frequently are developed to such an extent in states bordering Missouri—yes, in states far east of it—as would make the average Missouri specimen hang his ears in shame.

The gist of the criticism of *The Public* is that the



Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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EDITORIAL ANNOUNCEMENTS.

Passes.—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

Addresses.—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particularly as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

STEEL BOILERS.

It is now only a few years since the first timid experiments were made in the use of steel plates for fire-boxes in locomotives. At first their use was attended with many discouraging failures, and those possessed with the wisdom of inertia shook their heads sagely and predicted that steel "would never do" for boiler material. The successive yearly reports of the Master Mechanics' Association contain the records of the experience of many of its members who were at first much discouraged at the results obtained. The failure of the plates from cracking was the great evil complained of, and it was no uncommon event to have a locomotive, otherwise in excellent condition, rendered useless, at least temporarily, by the sudden cracking of a steel fire-box plate attended by a loud report like that of the discharge of a musket. Failures from this cause were so frequent and so annoying, when steel plates were first introduced, that it became a serious question whether the evil was not so great as to prevent the new material from taking the place of, or being substituted for, iron. It was the subject which elicited most discussion and excited the keenest interest at the annual conventions of the Master Mechanics' Association, and the manufacturers of plates were, some of them, driven almost to distraction by the mysterious failure of their plates without the slightest apparent cause and without any previous indication of weakness.

All kinds of theories were advanced and tests proposed to determine the enduring quality of steel. Naturally at first it was thought that the strongest steel, or that which would bear the greatest strain without breaking, would stand the best. But the hardest and most brittle steel, although the strongest, fractured the easiest. Then it was thought that the most ductile steels would do best,

and that which had the least tensile strength was recommended. It was thought, too, that if steel had a sufficient amount of carbon in its composition to temper it, it would be unsuitable for fire-box plates, and therefore it was tested by heating and plunging in hot water and then bending it. If it became brittle by this process it was condemned. But none of these tests were conclusive, and plates which had cracked in use would stand all of them successfully. Then it was thought that the trouble grew out of the manner in which the material was worked, and directions were given to handle it with as much care, almost, as plate glass or the most fragile material would be. The rivet holes, it was said, must not be punched, but must be carefully drilled and the plates annealed after each operation of flanging or change of form, and in one little book, written by Barda, of France ("The Use of Steel in Construction"), the directions for working indicated that if the material required as much skill and care and watchfulness as the author advised, it would be a very serious objection to its use for general purposes, where it must necessarily be handled and worked by men of only ordinary intelligence and skill, and who in the usual course of events cannot be expected to exercise as much care as, according to the writer of the book referred to, was required to use it successfully.

With greater experience and the knowledge which resulted therefrom, and which was acquired by careful investigation the manufacturers have been able to produce boiler-plates of steel of such a quality and so much uniformity that there is now less risk in using them than there would be if iron plates were employed. The mysterious cause of the failure of plates seems, somehow, to be almost entirely eliminated, and nearly all master mechanics and locomotive builders are now using steel, not only for the fire-boxes, but for the shells of their boilers, with the utmost confidence in its reliability for such purposes. Steel is, however, what may be called a much more highly organized material than iron. That is, its qualities are affected much more by slight changes in the ingredients of which it is composed, than is iron; and it is also subject to great modifications by the influence of heat and cold. When of the right quality, and when used under favorable conditions its strength, endurance and what may be called its *workableness* far surpass the best iron; but at times it has proved to be the most treacherous of materials, and has failed suddenly without giving any premonitions, and apparently without cause. It is, therefore, not remarkable that both the manufacturers and the users of steel boiler plates should have given much time and study to the nature of the material, with a view of eliminating the causes of its failure.

Two reports on the use of steel made by committees appointed by Lloyd's Register of British and Foreign Shipping have recently been published in the European engineering papers. One of these refers to its use for shipbuilding and the other to steam boilers. Both contain much useful and interesting information, and will doubtless do much to formulate the experience of English engineers into more or less reliable rules for determining the quality of the material, and the conditions under which it should be used. We regret that these reports are too long to reproduce entire in our pages, and therefore that only the conclusions can be given.

From them it will be learned that in Great Britain Bessemer steel boiler plates are very extensively used, whereas in this country the Bessemer process is not employed at all for the manufacture of such plates.

The methods adopted by different manufacturers for determining the quality of the plates produced are fully described, and are some indication of the means which have enabled them to produce a material of uniform and reliable quality. At some of the works "a small ingot is cast from every charge for the purpose of testing, both chemically for the percentage of carbon, and mechanically for the tensile strength and elongation. These tests are made before the ingots obtained from the charge in question are appropriated to a definite use. If, therefore, it is found to be too highly charged with carbon, and the tensile strength is too high, instead of being made into plates, the charge in question is appropriated to making rails or axles, or for other suitable purposes." The committee, who visited many of the works engaged in the manufacture of steel boiler plates, also say that the custom prevails, at all of them, of testing a shearing from each plate "either by a simple cold bending test, or by a temper test."

The following test for determining the amount of carbon in any specimen of steel will probably be of interest and perhaps of use to some readers:

"The test consists of dissolving a certain quantity of steel, weighed with the greatest minuteness, in a fixed quantity of nitric acid. This solution is of a straw color, and the shade of color depends upon the amount of carbon. If there is a

large percentage of carbon, the color is deep; if the percentage is small, the color is proportionately light. These solutions are made in glass tubes, and they are compared in color with standard tubes, containing certain known and fixed percentages of carbon; and the fluid to be tested is diluted with water in a graduated tube until the color agrees with that of the standard, and the percentage of carbon in the steel is given by the reading on the graduated tube. This test is said to be absolutely reliable until the carbon becomes as low as 0.15 per cent., and is a very fair indication down to 0.1 per cent.; but below this the test is not considered accurate."

The committee visited the extensive shops or "engineering works" of the London & Northwestern Railway Company, at Crewe, and report that nearly the whole of its locomotive engines and boilers, tires, axles, crank-shafts, etc., are made of mild steel; "and their experience of it is of the most satisfactory nature." The steel plates used at Crewe are somewhat more highly charged with carbon, and therefore stronger than would be aimed at for ship plates, but they are all annealed after being sheared and punched and ready for use.

Among the tests which are often used to determine the ductility of steel or other metal is that of breaking a bar by tension and measuring the amount of elongation. The committee call attention to the fact that if the elongation is measured in percentages of the whole length of the test piece, they will vary with the length of the piece, for the reason "that near the point of fracture the elongation is much greater than at other parts of the specimen. With material, therefore, of equal quality, the shorter the specimen tested the higher will be the percentage of elongation."

In the tests which the committee made it was found that specimens of the same material, 8 in. long, stretched about 20 per cent., whereas when they were made 6 in. long they stretched 25 per cent., and those 4 in. long about 32 per cent. At Crewe the specimens tested are all 2 in. long, and the elongation averages about 37½ per cent. This indicates that it is desirable to establish some standard length for such test pieces, for the purpose of having some modulus of the ductility of steel plates.

A good deal of discussion is also given to the subject of the limits within which tensile strength of steel should be confined.

As stated in the early part of this article, it has been thought by some that steel which had the *least* tensile strength was the best suited for boiler material. With reference to this the committee report that "it is said by some that when steel gets down to about 26 tons (of 2,240 lbs.) in tensile strength, it begins to be more spongy, and is less capable of being welded than steel of 28 tons per square inch, and it is urged that steel between 30 tons and 32 tons strength, if it fulfills all the other conditions of ductility, is a better material than the weaker, and sometimes less ductile, material having a tensile strength of 26 tons."

The committee recommend that for ship plates the limits be fixed at 27 to 31 tons per square inch, the mean of which would be about 65,000 lbs. One of the manufacturers of boilers who has used steel very extensively recommends that the strength of steel plates should not exceed 29 tons (65,000 lbs. nearly) per square inch. Mr. Webb, of Crewe, was in favor of rather higher limits. Commenting on the information which they have received, the committee who reported on steel plates for boiler making say: "Taking into consideration the fact that the milder material is more easily worked and less likely to be injured by careless manipulation than that of higher strength and more brittle nature, and that in the ordinary run of boiler yards there will be found neither the appliances nor the extreme attention paid to the work as at Crewe, we are of opinion that it would not be prudent, at least until further experience is gained, to raise the limits; while at the same time it might be advisable to recommend that plates used in the construction of the furnaces and combustion chambers be specified to withstand not more than from 26 to 28 tons per square inch" (a mean of 60,000 lbs., nearly).

So much that is of interest and value is contained in the reports, for which there is not room this week, that the completion of what remains to be said must be deferred until a future occasion.

THE REDUCTION OF FIXED CHARGES.

The adoption by the Pennsylvania Railroad Company of the plan for a sinking fund by which the company will begin to clear off the enormous obligations that it has assumed is a notable event in the history of American railroads. In many of our companies the number of stockholders who are permanent holders and identify the company's interest with their own is so few that it is very difficult to adopt any policy which provides for the permanent improvement of a company's property by a reduction of the current income of the stockholders. Cases are common enough where net earnings

are applied to construction, especially with companies which never have paid dividends. In those cases, however, the stockholders do not have their income reduced. When for a number of years they have received dividends regularly and of a uniform amount—6, 7, 8 or 10 per cent., as the case may be—they come to look upon their shares as if they were bonds, as a security from which an income is owed them, instead of a share in a commercial enterprise, yielding greater or less profits according to the times and the circumstances, and which should receive no part of the profits until future as well as current debts are provided for. It is the duty of a corporation, as much as of an individual or firm, to look forward and see that means are adopted to meet obligations that will fall due in the future. If Brown & Smith have borrowed \$10,000 at 7 per cent. for five years to use in their business, and after paying expenses and the interest on that debt have a net profit of \$2,000 a year, they are not justified in dividing the whole of that profit unless, in the first place, they have every reason to believe that the security on which they have borrowed the \$10,000 will be sufficient at the end of the five years to secure a renewal of that loan, and, in the second place, unless there is a good prospect that the profits of their business will keep up. It may be that their business is declining, that there is reason to fear that by the time their debt is due the business will no longer yield enough to pay the interest, or at most so little that their credit will not be good for a renewal of their loan. In that case if they divide their total profits they will inevitably fail to pay their debts, and will be really guilty of cheating their creditors.

Now the stockholder in a railroad company has no less obligations to provide for the liabilities of his company than the partner in a firm. He has no right to take profits this year which will be needed to pay a debt next year.

But the step taken by the Pennsylvania Railroad Company is not only intended to protect its creditors, but also to add to the property of its shareholders. And the way in which it becomes profitable for it to take its profits to purchase its bonds, or the stocks and bonds which it has guaranteed, may also be illustrated by the policy of a firm or individual.

If a merchant or manufacturer has raised capital for carrying on his business by notes and bonds on long time at 7, 8 and 10 per cent. interest, and finds that in a time of reduced profits his unmatured paper is offered at prices much below par, though at that time he can make but 4 or 5 per cent. on any new investments, certainly it will be the most profitable of all investments to him to buy his own paper. Whatever doubt others may feel as to the security for such paper, for him there can be no doubt that as long as he has any property these debts must be paid. United States bonds and English consols can not be safer to him than his own debts. Whether it will be profitable for him to buy them or not depends upon the use he can make of his profits. If he can make a higher interest on them by investing them elsewhere than would be yielded by his own paper at the current price, then they will be, for him, a bad investment, but if they will yield more than he can make in any other investment, then they will be the best of all investments for him—yielding the largest interest, and, more than all, being the safest possible.

Now at the present quotations, some of the stocks on which the Pennsylvania Railroad Company has guaranteed dividends as rental yield an interest of nearly 10 per cent., and a great many millions of the securities on which it will have to pay interest as long as its own stock is worth anything—that is, as long as it has net earnings enough to pay it—yield 8 per cent. This is a very high interest for a safe investment in these days, and, as we have seen, for the Pennsylvania Railroad Company, and therefore for the partners in that company, who are its shareholders, it is an absolutely safe investment.

If this company could continue to purchase at current prices the securities for which it is responsible until it had bought the whole \$180,000,000, it would make an enormous profit on the operation—that is, it would make many millions more than if it should simply continue to pay the interest and dividends as they accrue and retire the principal of the bonds when it became due. But there is not the least probability that it will be able to do so, for the more it buys the higher will the price become. The value of its guarantee depends upon the amount of margin of its net earnings over its yearly fixed charges. When it owns \$90,000,000 of the \$180,000,000 of its obligations, the security of the amount outstanding will be much greater than it is now, and that fact will be appreciated by the holders. They may then hold Cleveland & Pittsburgh 7 per cent. shares to be as valuable as Pennsylvania Railroad 6 per cent. bonds, and ask 100 or 110 instead of 73 for them. And

it is quite possible that the prices of Pennsylvania Railroad securities may in turn be so appreciated by the working of this sinking fund that it will be no longer profitable to purchase them for it.

But if this occurs, the sinking fund will have served its purpose. The obligations outstanding will have been so reduced that there will no longer be any doubt as to their regular payment, and for the same reason the margin of profit available for dividends will have increased. When this is the case, the company's financial condition will have become thoroughly sound and satisfactory, and the further increase of the sinking fund will have become a matter of indifference.

But even if this effect is not produced, the wisdom of the policy will be none the less. Indeed, it will be all the greater. If, with a material reduction of the annual fixed charges the company's surplus profits are so small that the market price of its securities continues low, and dividends cannot be increased, or are passed altogether, then evidently the company, but for the sinking fund, would become bankrupt. That is, the policy will increase profits if profits are possible, but if they are not possible, then it may be equally advantageous by warding off disaster.

This step is notable as the most important ever taken by an American company to reduce fixed charges. In a time of prosperity, when capital readily earns a high rate of interest, a large funded debt may seem to be quite unobjectionable. We borrow money at 8 per cent. and make 9 or 10 per cent. on it. But when values sink, and especially when the general rate of interest on capital falls, then these large debts become dangerous and often fatal. They were very well when we earned 8 and paid 7 per cent.; they are deadly when we pay 7 and earn 4.

Here is a company, with a capital of \$50,000 per mile, half stock and half bonds, paying 7 per cent. on the bonds, and, in flush times, earning 8 per cent. on the whole capital. It has a surplus of \$2,250 a year, equivalent to 9 per cent. on the stock, and its debt appears light. But times change; only 6 per cent. and finally only 5 per cent. can be earned by the capital invested, and the surplus sinks then to \$1,250 and \$750 per mile, equivalent to but 5 per cent. and 3 per cent. on the stock, and then the debt is felt to be a burden. The credit of the company is injured, and its power to take advantage of circumstances by investments of new capital, whether raised by new shares or bonds, is largely destroyed. Now railroads on the average will share the fate of other investments of capital sooner or later. They will not generally earn a much larger average income on the capital invested in them than is yielded by other investments in enterprises of similar risk. This is no peculiar misfortune if the capital is all represented by stock. But if a very large share of it is represented by bonds, then the shareholders find that not only have they shared the common fate of all capitalists by a reduction of the returns on their own capital, but that they are still further burdened by the necessity of paying to their creditors an interest greater than the property represented by the debt can earn. Formerly part of the earnings of the capital represented by the bonds went to swell the earnings of the share capital; now part or even the whole of the earnings of the share capital has to be added to the earnings of the borrowed capital in order to make up the interest on the latter. The safety of stockholders requires either that debts should be funded at a very low rate of interest, or that they should form but a small proportion of the total corporate capital, instead of one-half, as is the case now with the average American railroad. Just now there are frequent opportunities for amending this condition of things. Reorganizations in consequence of failure are almost every-day affairs. We notice, however, in many instances the reorganized company is left burdened with an undue amount of fixed charges, likely in time of misfortune to wreck it a second time. People who have once been bondholders somehow seem to think that there is some magic in names which may enable them to receive more from their property than it earns. Perhaps it will require a series of second bankruptcies to convince them of their error.

Hog Packing in Chicago.

The Chicago packing season just closed was a brilliant one for Chicago, if anything connected with the least lovely of animals may be called brilliant. Put it in language more suited to hogs, the business was a big one. For in packing the hogs form so much the largest part of the business that it is hardly important to consider anything else. The yearly "hog crop," as shown by the results of the packing season in the Northwest, had shown some decline for two or three seasons until this last one, though perhaps this was due more to the increase in summer packing than to any decline in the total number packed; but this last season shows results not only greater than those of the preceding one, but really greater than those of any previous season. There were

many more hogs packed and their aggregate weight was greater. Thus the number and aggregate weight of the hogs packed in Chicago, for the past five years, during the four months of the packing season, have been:

Year.	Number.	Tons.
1873-74	1,320,024	184,519
1874-75	1,090,348	179,531
1875-76	1,592,065	172,996
1876-77	1,618,084	174,731
1877-78	2,501,285	285,618

Thus, compared with the previous season, last winter's business shows an increase of 54½ per cent. in the number, and 63½ per cent. in the weight of the animals packed—an increase that seems almost incredible, considering that the country from which supplies of hogs come has not had any extraordinary growth recently, and that there was a good corn crop in 1876 as well as in 1877.

This number of hogs, packed and nearly all brought to Chicago within four months, was equivalent in weight to 9,530,000 bushels of wheat, and made considerably greater demands on the railroads than an equal weight of grain, as hogs usually are not carried in loads of 20,000 or 24,000 lbs. per car, like grain, for want of floor room in the cars. They also bring a higher rate than grain; partly for this reason, and partly because the animals are worth more per pound, and can bear a higher rate.

Taking the summer and winter seasons together, the number of hogs packed in Chicago for five years has been, the years ending with February:

Year.	Summer.	Winter.	Whole Year.
1873-74	31,571	1,425,079	1,456,650
1874-75	306,536	1,520,024	1,826,560
1875-76	446,398	1,690,348	2,136,746
1876-77	728,781	1,592,065	2,320,846
1877-78	1,315,401	1,618,084	2,933,485
1877-78	1,508,026	2,501,285	4,009,311

Taking the totals, there is an uninterrupted increase since the panic year, but what is most astonishing is that just about one-half of the whole increase of the five years has been made since last year. The packing of 1877-78 was 37 per cent. greater than that of 1876-77. This would not be so remarkable if Chicago had been diverting the packing business of the other Western cities. But this is not the case. Generally their business has grown somewhat, though by no means as rapidly as that of Chicago, which seems to secure most of the increase of the packing business.

It is, however, probably true that Chicago has diverted some packing business, though not from Northwestern cities. We have no statistics for the packing of Eastern cities, but we understand that an important part of it, that done in the summer, has greatly fallen off since the recent great growth of summer packing in Chicago. This latter is the phenomenon of the trade. We see that it has been almost entirely created since 1872-73, and that last year it was nearly equal to any previous winter season's packing, though to but three-fifths of the last phenomenal winter's packing.

This would be an important change in the trade for the carriers as well as the packers, if it were a creation of new business and not a diversion of summer packing formerly done in the East. The indications are, however, that it is chiefly a diversion. The total receipts of hogs have not increased within the five years that the packing has more than doubled. Indeed, the receipts of the calendar year 1873 have never been equaled since. But the shipments of hogs from Chicago have decreased as the yearly packing has increased, and in 1877 these shipments were nearly 1,500,000 head less than in 1874, while the number packed was 1,200,000 greater. The difference to the carriers is that those east of Chicago now carry hog products where formerly they carried live hogs.

Chicago packed last winter more hogs than all the other five leading packing cities put together, and a single Chicago firm put up more than the whole city of Cincinnati, which stands second in the list, as it long stood first.

This business is one of especial importance to the railroads, because they not only have to carry the hogs to Chicago, but they have to carry most of the product, which is nearly equal in weight to the animals, to the East and South. Most of the grain arriving at Chicago goes to the East by lake and canal; but this is not true of provisions. A considerable part of them, it is true, makes half the journey by lake, for there is quite a provision business by the "lake and rail" routes—that is, by propeller to Buffalo or Erie and thence by rail. But very little goes by canal, though a few considerable shipments were made last year by this channel, and a great deal was said of them. The record of shipments from Chicago for 1877, however, shows that but 5.6 per cent. of the total shipments of hog products were made by lake that year, and as most of these were carried by the propellers of the trunk lines, it is evident that the diversion by the canal could not have been at all formidable.

The competition of the water route, however, compels the acceptance of low rates for carrying hog products, which otherwise, because of their value, could be made to yield a pretty good profit. Last year the regular rate was 45 cents per 100 lbs. until July; but up to that date a very large proportion of the shipments were made on contracts entered into the year before at 20 cents or less; and when July came it was thought necessary to reduce the rate to 30 cents, that is, as low as the grain rate. That provisions can bear more than the grain rate may be inferred from the fact that 30 cents per 100 lbs. at present prices adds about 17 per cent. to the present Chicago price of wheat, nearly 40 per cent. to that of corn, but less than 6 per cent. to that of bacon. The railroads, however, have to take what they can get, and they seem to have concluded that when navigation is open provisions are among the articles that must have the lowest rate.

The product packed in the winter is usually largely held in Chicago to be shipped in the spring and summer. The extremely low winter rail rates have doubtless tended to in-

crease the winter shipments this year, but it is not at all likely that they have done so to such an extent as to bring down the stocks to their usual amount at this time of year. These are sure to afford the roads to the East a large traffic within the next few months. That it will be a profitable traffic is by no means so certain. Even if rates are really restored and maintained hereafter, a good many contracts will be outstanding, and contracts are more likely to be made with packers, perhaps, than with any one else. Each controls an enormous business, which the roads make great exertions to get. A single establishment in Chicago last year, for instance, packed 140,000 tons of hogs—enough to afford about 45 car-loads of freight daily. It is in competition for the business of firms like these that rates are likely to be most reduced and contracts for the future to be made.

Two of the great staples of the Northwest, grain and hogs, thus have been affording since last fall a traffic large without example. The third, which is horned cattle, is not likely to increase very greatly from year to year, because the market is limited chiefly to this country, and no increase of 20 per cent. or so in the consumption of beef can be expected of a population which does not increase more than 2 per cent. in number. But the Northwest apparently has done all that could be expected of it to make traffic brisk, and has really made a brisk traffic in its products. If other industries had made anything like the same progress, the railroads would be far busier than ever before.

A New Car Heater.

A trial was made last Monday on the New York Elevated Railroad with a new car heater designed by Mr. W. C. Baker, for heating cars by the "surplus" steam from the locomotive. The heater consists of a 1½ in. steam pipe laid lengthwise along the whole length and on each side of the car near the floor. This pipe is surrounded by a sheet iron tubular casing 4 in. in diameter, and the space between the two is filled with sand. The steam pipes are connected together between the cars and engine with ¾ in. rubber hose, wound with strong twine so as to give them the requisite strength to resist the steam pressure, which is the same kind of hose that is used for steam rock drills.

The great difficulty in heating cars with steam from the locomotive is that at times it is difficult and sometimes impossible to generate steam enough in the locomotive boiler to supply the cylinders, and there is then none to spare for heating purposes. The object of the sand packing of the steam pipes is to act as an absorbent of heat from the steam pipes when steam can be spared from the engine and is let into the pipes. When the demands of the engine make it necessary to shut off the steam from the cars the sand packing will have absorbed a sufficient amount of heat to keep the car warm for several hours.

About twenty minutes are required to warm the sand heaters from the engine, and it is said it takes from three to five hours for all the heat thus absorbed to be radiated from them after steam is turned off. The day of the trial was the coldest for several weeks past, with a high wind, yet the heaters kept all the cars in the train warmed from the Battery to Fifty-ninth street, a distance of five miles, after steam was shut off.

Not only do the sand heaters serve the purpose of absorbing heat, but they also prevent the temperature of the pipes becoming so high as to be unpleasant or injurious to the dress or persons of passengers coming in contact with them. Inclosing the steam pipes with a slow-conducting substance also prevents the rapid condensation of steam, which occurs when it enters pipes exposed to cold air. In such cases the first pipes or radiators are heated to a high temperature, whereas those at a distance remain cold. If the steam is carried through the first cars in pipes exposed to the air, they are likely to be heated too hot, whereas those farthest from the engine will not receive heat enough. With Mr. Baker's arrangement the heat in the pipes nearest the boilers is protected from too rapid radiation, and is thus carried to the end of the train. His invention seems to overcome the chief difficulties in the way of using steam from the locomotive for heating purposes, and promises to be very successful. It is proposed to use these sand heaters in horse cars and charge them with heat at the end of each trip by connecting the pipes with a stationary boiler.

Under each car is a trap to catch the condensed water, which is collected in a suitable reservoir, as it cannot be allowed to escape on an elevated railroad to the street below, but must be retained until the end of the trip.

Among the persons present at the trial was Mr. A. B. Pullman, Dr. J. S. Freer, Dr. Gilbert, Colonel W. T. Pelton, Mr. Onderdonk, Dr. Perry, Colonel Ricker, Mr. F. H. Andrews, C. E. Garey, and about fifty other gentlemen interested in railroads.

Locomotives for the New York Elevated Railroad.

The question of locomotives for this road has recently been very fully discussed and the opinions of those who were consulted with reference thereto were divided between four-wheeled engines similar to those now used on that line, and eight-wheeled tank engines of what has come to be called the "Forney" plan. The conclusion finally arrived at was to order ten engines of each class, both to be so constructed as to be readily altered from the one plan to the other.

The contract was finally awarded to the Baldwin Locomotive Works of Philadelphia and the Rhode Island Locomotive Works of Providence, each establishment to build five four and five eight-wheeled engines.

The eight-wheeled engines are to weigh about 26,000 lbs. with full supply of water and fuel. The cylinder is to be 10 × 14 in., driving-wheels 38 in. in diameter, spread 5 ft.; the

total wheel-base to be 14 ft. 6 in. Tank to hold from 450 to 500 gallons of water and 400 lbs. of coal. The weight in driving-wheels is to be not less than 15,500 nor more than 16,500 lbs. with engine in working order, with the boiler and tanks filled.

The fuel to be used is anthracite coal.

The four-wheeled engines are to be of the same dimensions, excepting that the wheels will be spread 6 ft. from centre to centre. The water on these engines will be carried in a tank on each side of the boiler, instead of one on the truck as in the case of the eight-wheeled engines, the capacity of the tanks to be 350 gallons.

The question of the relative merits of these two classes of engines for such service is a very important one in the successful operation of elevated roads, and the results of this experiment, made on so large a scale, will be watched with much interest.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Springfield, Jackson & Pomeroy.—Extended from Washington Court House, O., south by east 6 miles. It is of 3 ft. gauge.

Junction City & Fort Kearney.—Extended from Clay Centre, Kan., north by west to Clifton, 17 miles.

This is a total of 23 miles of new railroad, making a total of 173 miles of new railroad completed in the United States in 1878, against 164½ miles reported for the corresponding period in 1877.

THE OPENING LAKE RATES are the lowest ever known, contracts being made at 3 cents a bushel for wheat and 2½ to 2¾ for corn from Chicago to Buffalo. The opening rate last year was 3½ cents for wheat, but it dropped immediately and did not average 3 cents for the first month navigation was open. In 1875 and 1876 the opening rate was 4½ cents. There is reason to suppose that the opening rate this year will be nearer the average rate. Last year the Chicago elevators were full, and when navigation opened there were cargoes for all the vessels for their first trip; this year the railroads have taken away the grain about as fast as it arrived at the lake ports, and cargoes will not be so easy to get as usual when navigation opens. Apparently vessel-owners fear a season much like that of 1876 or the first part of 1877. The average rate for 1877 was tolerably satisfactory and the average after July altogether so, but early in the year rates fell to the lowest point ever known, 1½ cents per bushel for corn (there was scarcely any other grain to carry) being accepted for a little while in June.

Although there is now but little grain in the western elevators, there is a great deal in the country yet to be marketed, so that it is reasonable to expect a more active movement before harvest than was experienced last year. Whether it will give the vessels more business or not will depend upon the share which the railroads take. If they continue to carry as much as they have during the winter, there will be a very poor showing for the vessels. They have been delivering at the seaboard at the rate of about 3,700,000 bushels a week since navigation closed last fall, and 4,000,000 bushels a week was about the average from the opening of navigation until August, in 1876, when the total movement was exceptionally great, and the railroads were carrying half the grain. Rail rates may be as low this season as they were then, though this is not probable; but if so, doubtless, the lake and canal rates will be lower than they were then, and it is hardly probable that the railroads will carry so large a proportion of the grain this season as they did in 1876.

STATE OWNERSHIP is likely to be tried in France for the second time. It is not, however, as a matter of principle that railroads are now to be acquired, but rather as one of policy under special circumstances. There were a number of suffering, bankrupt and half-finished roads, chiefly in the southwestern part of the republic, which were offered, on certain terms, to one of the six great companies. This company refused them, and now the Minister of Public Works has submitted a plan for purchasing them and putting them in condition to serve their purposes. In submitting his plan the Minister of Public Works says: "It is important not to confound principles; this is not the case of a purchase required by the State for its own interest, but is a purchase granted to companies in distress as an act of pure benevolence, prompted, moreover, by the interest of the inhabitants." He does not propose a plan for working the roads, and they may be leased to one of the great companies or to a new corporation organized purposely to work this system. There will be, however, a party strongly in favor of having the government work the purchased roads directly; and it would seem that no country could do such work to better advantage, as France has a large and excellently-trained corps of technical officers, many of whom have had long service on railroads. The total length of the lines to be purchased (there are 17 of them, and some have branches) is 1,624 miles, scattered over a considerable territory, and interlaced with the lines belonging to one or two of the great companies. The cost is estimated at about \$65,600,000, or \$44,000 per mile; but to complete them a further expenditure of about \$33,000,000 is thought to be required, which will bring up the average cost to about \$84,000 per mile. Then some of them are not expected to pay their working expenses for some years.

FEBRUARY EARNINGS are reported in our table for 33 railroads, having a total of 16,883 miles of road, which is about 21 per cent. of the total mileage of the United States. These roads, with 3.6 per cent. greater mileage than in the corresponding month last year, had gross earnings larger by 11.3

per cent., and their average earnings per mile of road increased from \$375 to \$403, or about 7½ per cent. February of last year, however, was an unfavorable month. The snow blockades in most cases did not last after January, but there was not a great deal of traffic to carry, and though business was largely taken under time contracts at unprofitable rates made the summer previous. The 23 roads which reported for that month last year earned but \$375 per mile, as against \$433 in 1876, which latter, however, was an unusually favorable month. Of the 33 roads reporting this year twenty show an increase and thirteen a decrease in earnings per mile. Five of the roads, with 5,306 miles of line, extend from Chicago westward—32 per cent. of the whole. All but one of these show an increase in gross earnings, and their aggregate increase is the very large proportion of 28 per cent. By far the larger part of this increase is on the two great wheat carriers, the Chicago & Northwestern and the Chicago, Milwaukee & St. Paul, which last year had an extraordinarily small crop to carry and this year are having an extraordinarily large one. Six of the roads, with 2,394 miles of line, or 14 per cent. of the whole, have termini in St. Louis, and are carriers of produce to that city. Three of these show an increase and three a decrease of gross earnings for the month, the aggregate being nearly the same for the two years (1.6 per cent. less this year). Four roads largely supported by Texas traffic (two in Texas) show an aggregate decrease of more than 12 per cent., only one showing an increase.

For the two months of January and February we have reports from 33 roads with 17,893 miles of road, or about 22½ per cent. of the total mileage in operation in the United States, and 3.3 per cent. more than last year. Twenty-two of these roads show an increase in earnings per mile, and the average of the 33 has increased from \$315 to \$303, or 10.8 per cent. The twenty-three roads from which we had reports last year showed a decrease in earnings per mile, as compared with 1876, of 10.9 per cent. This year seems to have brought the roads back to the favorable results of that winter. The aggregate earnings of the 33 roads reporting this year have been for the two months (with 3.3 per cent. greater mileage) 14½ per cent. more than last year.

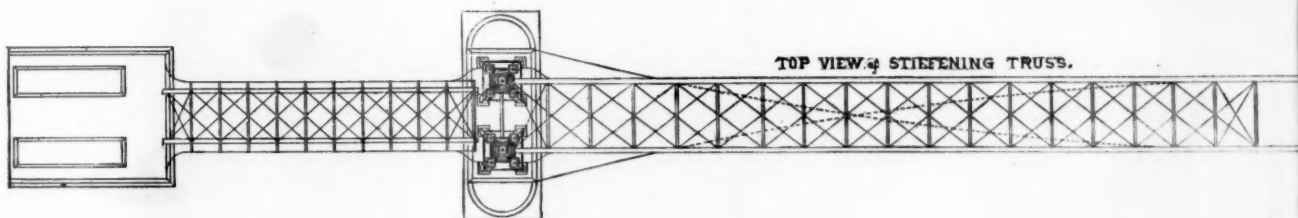
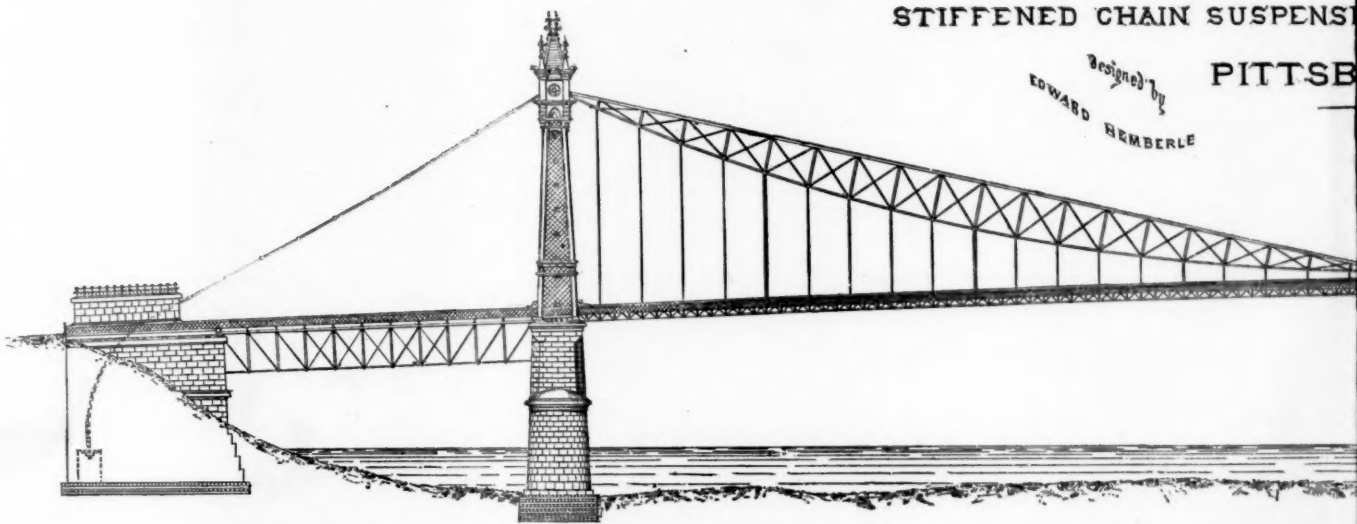
DIFFERENTIAL TARIFFS, that is lower rates for some tariffs than for other, or for long distances than for shorter ones, etc., came up as a subject of discussion at a recent session of the Parliament of the German Empire. Prince Bismarck expressed generally his disapproval of them, but said that he was compelled to permit them on two lines which compete with each other and over both of which he has a powerful if not a controlling influence, one being worked by the Empire, of which he is Chancellor, and the other by the Kingdom of Prussia, of which he is Prime Minister. That is, he felt virtually compelled to compete with himself, so to speak, and in that competition to permit a practice which he disapproved. He is in this respect situated very much like the Pennsylvania Railroad Company, which has a controlling interest in one railroad from Indianapolis to St. Louis, and, through the leased Fort Wayne road, a large (half, we believe) interest in another; and much of the time has to permit the competition of the two for through business.

In Germany, great complaints are made that the rates on grain and timber from Hungary through Austria and Germany to the North Sea ports are very much lower than the local rates, and frequently lower for the whole long distance on the imported products than for a part of the same distance for the productions of German soil. Yet these tariffs are made under a law which expressly forbids such differences—there called "differential tariffs"—"except when peculiar circumstances justify the exception;" and makes the approbation of the states in which the roads are situated indispensable before such rates go into effect. In this case, if the Hungarian or Roumanian or Russian grain could not get the terms of these differential tariffs from these German roads, it simply would not pass over them, but go to the Adriatic at Trieste, and thence by sea, or take some other route which would pass around Germany. It is the old story, no where more familiar than in this country, but here not giving occasion to national jealousies as in Europe. The fact that there, with all the requisite power to prevent such "discriminations," and a very decided disposition to do so if the public interests could be forwarded thereby, the governments have felt compelled to approve them affirmatively, indicates the indispensability of such differential rates in any national railroad policy.

THE SOUTHWESTERN RATE ASSOCIATION is succeeded by an organization of the Chicago members of it, who will thus be able to avoid competition with each other and to act as a unit in their competition with the St. Louis roads from Missouri River points. There is no more reason why the members of the disbanded Association should begin a war of rates than there ever was for such a struggle among them before the Association was formed; but experience has shown that such a struggle, of longer or shorter duration and of greater or less severity, is liable to break out at any time when there is no agreed division of business to take away all the motives for it. But the dissolution of the agreement is by no means equivalent to a declaration of war; it is simply a return to the condition of things before the alliance. The members are no longer allies; neither are they declared enemies. Whether the new alliance made between a part of the old members will increase or decrease the prospects of war remains to be seen. It will probably be somewhat more formidable as an enemy than the several companies acting separately, and if peace is maintained it will be able to do some good to its members by reducing expenses and avoiding competition with each other. Moreover, it will form an organization which will probably be at

POINT
STIFFENED CHAIN SUSPENSION
PITTSBURGH

Designed by
EDWARD KEMMERLE



TOP VIEW OF STIFFENING TRUSS.

END VIEW

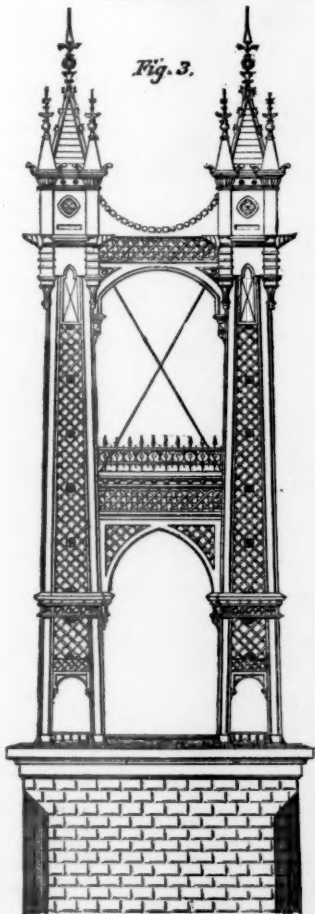


Fig. 3.

Fig. 4.
ANCHORAGE

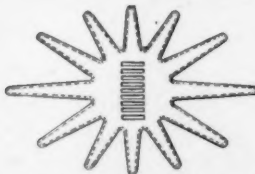
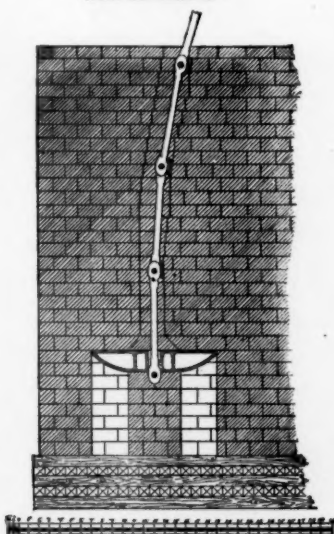


Fig. 5.



Fig. 6.

ANCHOR PLATE



POINT BRIDGE.

CHAIN SUSPENSION ACROSS MONONGAHELA RIVER
at
PITTSBURGH, PA.

Designed by
J. HEMBERLE

Built by
THE AMERICAN BRIDGE CO.

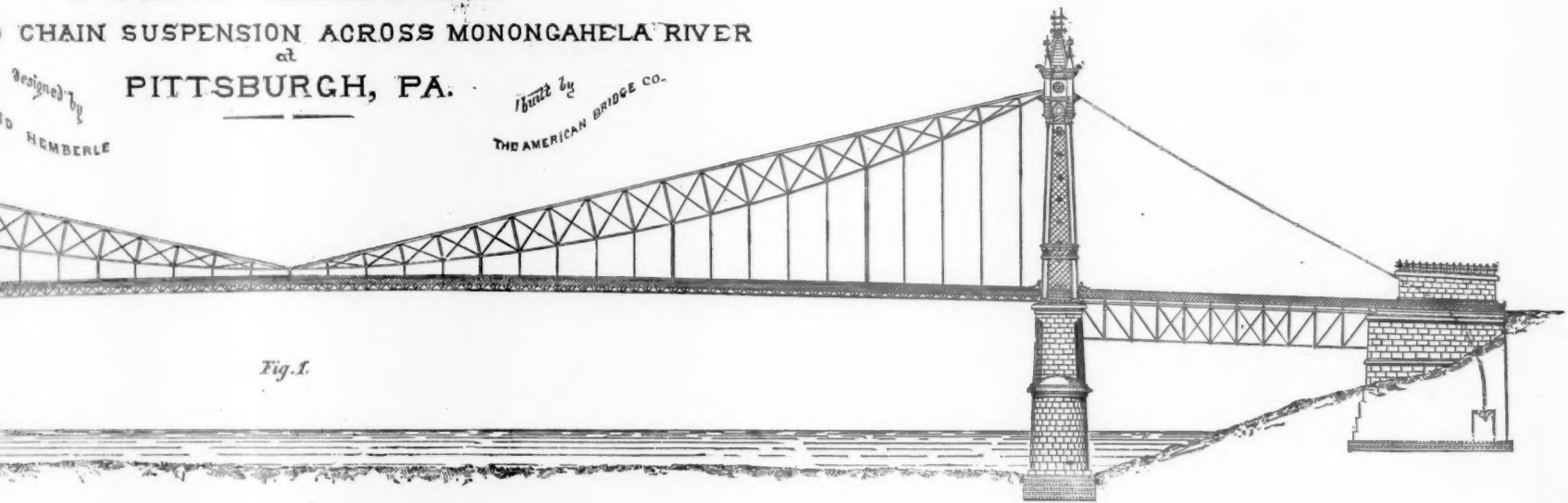


Fig. 1.

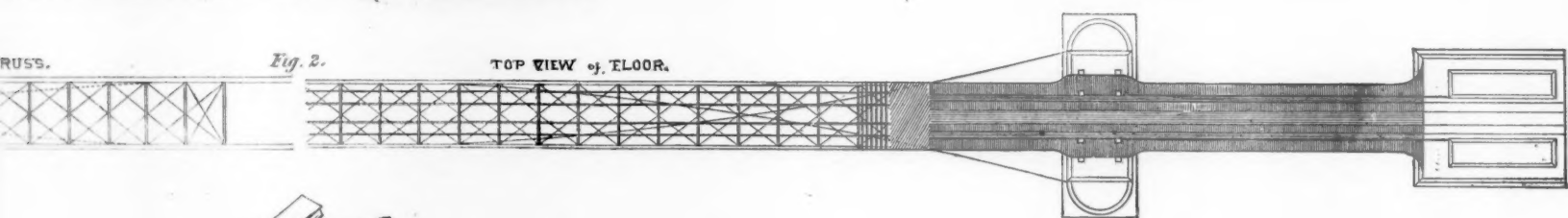


Fig. 2.

TOP VIEW OF FLOOR.

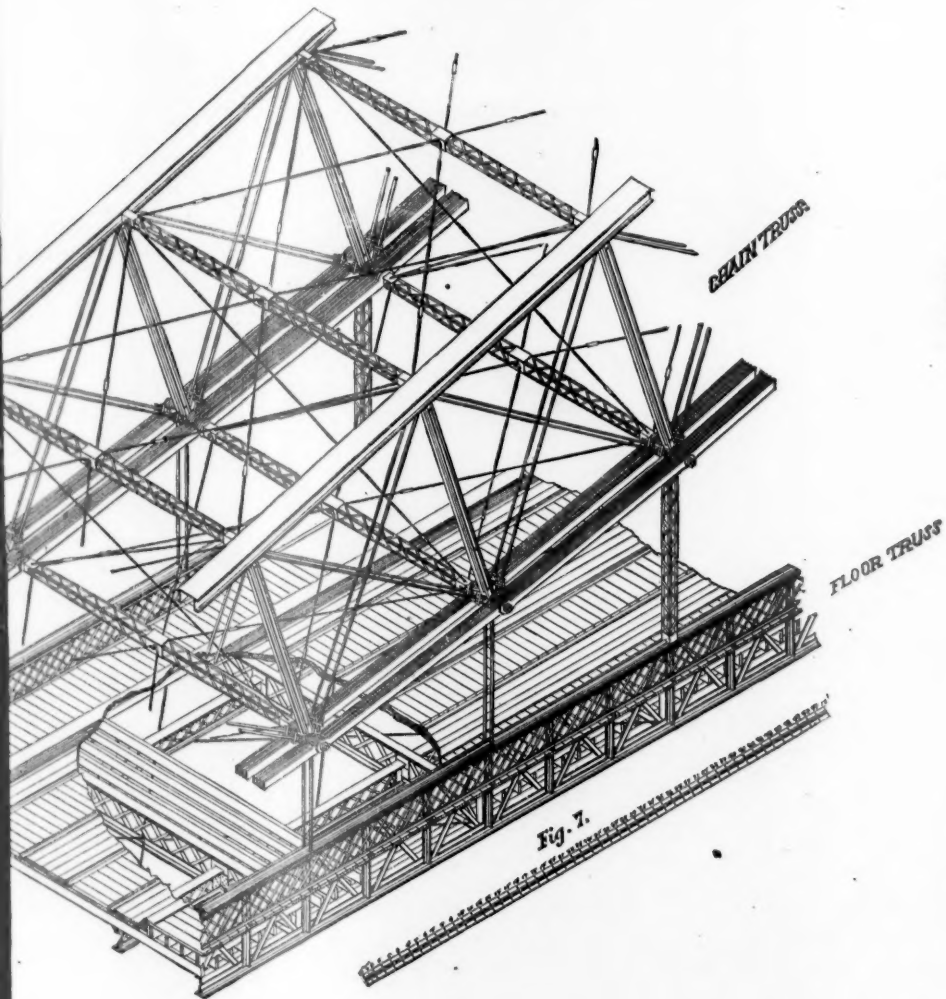


Fig. 7.

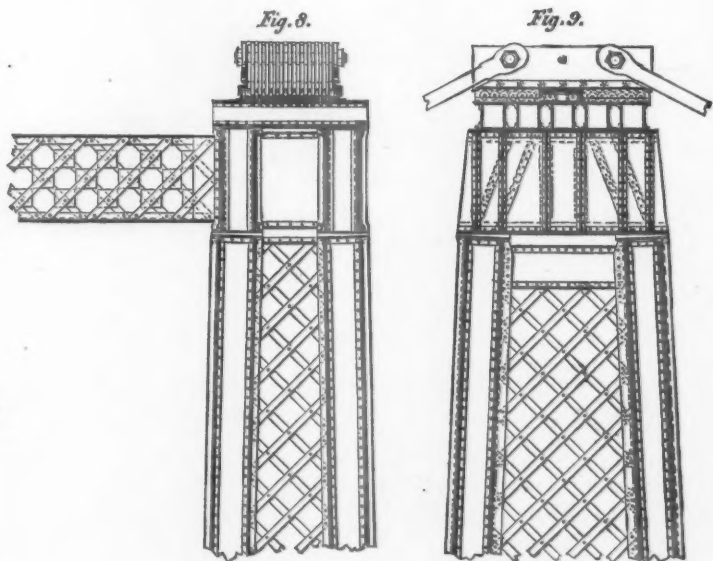


Fig. 8.

Fig. 9.

CHAIN SADDLE AT TOP OF TOWER

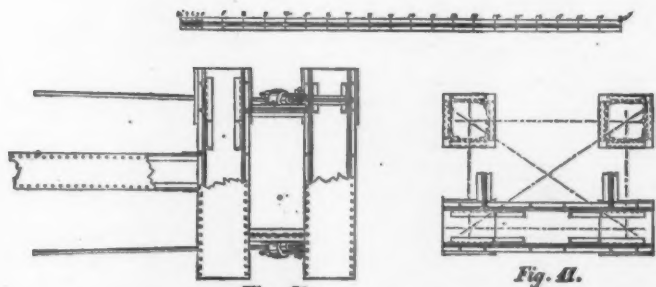


Fig. 10.

Fig. 11.

all times ready to take in new members interested in the business, and so may form a nucleus for a new Southwestern Rate Association. It would be an error to make the terms of an agreed apportionment of business forever unchangeable. Circumstances affecting the direction of traffic may change, new markets be created or the relative importance of old ones be altered. A distribution that was entirely just ten years ago may be grossly unfair now. Provision should be made for such changes, which in new countries are sometimes rapid and extensive.

LARGE SALARIES FOR RAILROAD PRESIDENTS are not wholly unknown in this country, and one man is often president of more than one company; but we know of no cases where one man gets several large salaries. If he is president of several it is usually of one controlling one and others subordinate to it, and then gets what is substantially one salary for doing one work; or he is not actively or constantly engaged in the business of the several companies of which he is president, and then gets but a nominal salary from any, or perhaps none at all. But in England there has been a tendency recently to engage an eminent man at a high salary as Chairman (they do not call him President) of a company, and yet not command his exclusive services, but give him leave, apparently, to take as many more chairmanships as he can get. One of these "plural chairmen" is Sir Edward Watkin, who is at the head of three important and distinct English companies, as well as of the Erie Reconstruction Committee; and recently was earnestly pushed, though unsuccessfully, for still another company. Recently Mr. J. S. Forbes, Chairman of the Metropolitan District Railway Company, at a salary of \$12,500 a year, and of the Great Western at the same salary, has been appointed Chairman also of a new short unfinished line to be worked by the Great Western, and for this he is to have \$25,000 a year guaranteed for three years. It is, doubtless, quite possible for a man to be worth fifty thousand dollars a year to a company, but we should say he would be much more likely to be worth that to one than to three or four companies.

THE ERIE FORECLOSURE SALE is again postponed. Last Monday was to be the day when that company's great property was to be knocked down to the highest bidder; but at that time suits were pending which the judges felt unable to decide before the sale. The postponement, however, was not ordered until about an hour before the time appointed for the sale. The postponement is for thirty days, which will bring it on Wednesday, April 24. A further postponement seems altogether improbable, as if the suits are not then decided the trustee will be permitted to go on with the sale on stipulating to grant to the plaintiffs whatever may be decided to be their right. It must be remembered that the suits are brought by parties who have a comparatively trifling interest in the property, and if they should be reimbursed for all the damages which they claim they may suffer, the amount required would not be large, and probably would be trifling compared with the damage resulting from the present unsettled condition of the company. The delay of reorganization has been the one powerful objection to the prosecution of the McHenry suits. However infinitesimal the interest of the plaintiffs, and however invidious the real objects aimed at by the suits, the owners of the property cannot suffer much from any number of charges and suits and investigations, if only they are not meanwhile prevented from taking the management of their property directly into their own hands. The suits may be annoying and a cause of some expense, but they ought not to hurt anybody.

THE GERMAN IMPERIAL BUREAU, which has a sort of general oversight of the railroads of the German Empire, except those in Bavaria, but has not nearly so close relations with the railroads as the officials of the separate States, consists of a President, with a salary of \$3,375; seven councilors and two assistants, who receive an average of \$2,000 each; eleven clerks and four assistant clerks, and seven messengers and servants—altogether 39 persons. In a recent debate in the Parliament of the Empire it was suggested that such a force ought to show some results to justify its existence. In the course of the explanation it appeared that a large part of the attention of the Bureau is given to the preparation of a general railroad law for the Empire. It has prepared two, which were not accepted. Prince Bismarck said that the chiefs of the Bureau found the means granted them so inadequate to the results expected that he could not keep them; two have resigned successively, and the Bureau has now no President.

THE WINTER GRAIN MOVEMENT for the fifteen weeks from Dec. 1 to March 16 has been as follows, for the past five years, the figures being for grain of all kinds, in bushels:

The receipts of the eight leading Northwestern markets were:

1877-78.	1876-77.	1875-76.	1874-75.	1873-74.
38,491,174	31,033,125	33,588,909	24,215,242	38,454,851

At last we see that this winter's receipts have overtaken and even passed those of 1873-74, which heretofore have been the largest on record.

The shipments of the same Northwestern markets were:

1877-78.	1876-77.	1875-76.	1874-75.	1873-74.
26,478,938	15,143,361	18,400,697	11,394,105	17,311,542

This winter's shipments were thus 44 per cent. greater than ever before known, and 75 per cent. greater than last year.

For the same fifteen weeks the receipts at the same Atlantic ports have been:

1877-78.	1876-77.	1875-76.	1874-75.	1873-74.
50,031,366	28,988,311	27,121,513	12,869,394	28,191,175

This winter's receipts thus exceed last winter's, the greatest known up to that time, by 72 per cent. The receipts for

these fifteen weeks are as great as those for the first 23 weeks of 1877, during ten of which navigation was open.

THE PROPOSED APPORTIONMENT OF EAST-BOUND FREIGHT was considered at a meeting held in Chicago Tuesday and Wednesday of this week. The prospect before the meeting seemed to be decidedly unpromising, no arbitration concerning Milwaukee business being acceptable, and Milwaukee being indispensable to the agreement in order to maintain rates at Chicago, and all the other rates depending on Chicago rates. It was reported Wednesday, however, that on Tuesday an agreement was reached as to the apportionment of shipments from St. Louis, Cincinnati, Indianapolis and Chicago and intervening points, and that the prospect seemed good for the completion of the work, and the report of Wednesday's proceedings states that the meeting "completed the apportionment," and agreed to make the grain rate hereafter 25 cents per 100 lbs., the fourth-class rate remaining 30 cents. We have no further particulars at present, but if an effective combination has at last been made, it is one of the most important events in the history of our railroads.

THE TRANSPORTATION OF CITY OFFAL has been undertaken at Stuttgart, Germany, by railroad, including, we believe, the entire sewage as well as garbage of the city. It is to be utilized for manure, and great hopes of success are expressed. Something similar was practiced at Bordeaux, in France, many years ago, but not with profit to those who undertook it, but with great improvement to hitherto barren lands in the vicinity. At Bordeaux, however, much of the drainage must have escaped directly to the Garonne and the sea.

THE BOSTON APPORTIONMENT covers not only shipments from Boston to Western competing points, but also those from East Boston, Lowell, Nashua, Worcester, Springfield, Providence, South Framingham, Northampton, Holyoke, Westfield, Salem and Fitchburg. So far the shipments of these places taken together are said to be about one-fourth as great as those from New York for the same time. All these places have the same rates as Boston, both to and from the West.

A TICKET-COUNTING MACHINE has been introduced in Germany, which is said to count packages of 10, 50 or 100 tickets with absolute exactness, bringing to view the face of every ticket as it is counted. The machines have been used for some time on the Hanover railroads, and have recently been ordered by several other German and Austrian roads. They are cheap—only about seventeen dollars for a single machine.

NEW PUBLICATIONS.

The *Financial Review* for the year 1878, which is of course, so far as it is a review, a review of the business of 1877, issued from the office of the excellent and trustworthy *Commercial and Financial Chronicle*, has all the usual valuable features, and one which to many will be worth more than all the rest. This is the January number of the "Investors' Supplement" which is issued the last week of each month with the *Commercial and Financial Chronicle*, but only to regular subscribers. We have several times called attention to this extremely valuable compilation, which gives, so far as possible, a statement of date of issue, amount outstanding, size, rate of interest, date of payment of coupons, place where payable, and time principal becomes due for every issue of bonds of all American railroad companies, and also of State and city, canal, express, etc., securities; also amount of stock outstanding, and time and rate of last dividend on it. All this is given in tabular form, easily referred to, and the value of this information is greatly increased by notes concerning the different companies, etc., often giving a brief statement of the results of the last year's operations; too often, alas! noting a default in the payment of interest, on the foreclosure of a mortgage. This is truly an investors' guide, and as there are doubtless many investors who are neither "commercial" nor "financial" men—or women, the "Guide" ought to be in demand by many who do not care to pay ten dollars a year for the *Commercial and Financial Chronicle* in order to get one copy of it. Here they can have it (for two dollars, we believe) with a quantity of other matter valuable to them as investors. This "other matter" we must pass over briefly. A general review of the year, statistics of banking and currency and of commerce, including comparative prices of merchandise for a series of years, imports and exports, prices of gold and exchange, and prices of stocks and bonds for a series of years, are among the features.

Foundations is the subject of No. 34 of Van Nostrand's Science Series, being a paper by a French engineer, M. Jules Gaudard, which was translated by a member of the British Institution of Civil Engineers, and published first by that society and afterward in *Van Nostrand's Magazine*. The book is perhaps smaller than the subject, but seems to be devoted almost entirely to the descriptions of different methods which have been practiced, and these are pretty fully illustrated. A book on the subject was much needed.

No. 35 of the same series is entitled *The Aneroid Barometer, its Construction and Use*, and is a compilation from several authorities on the subject, made by Prof. George W. Plympton. It originally appeared in *Van Nostrand's Magazine*.

Matter and Motion, by J. Clerk Maxwell, the eminent Professor of Experimental Physics at Cambridge University, and recognized as one of the ablest of modern physicists, forms No. 36 of Van Nostrand's Science Series. This is twice as large as most of the volumes of this series, having 224 pages, but as it is a severe condensation of the author's teaching, so much so that illustrations are sparingly introduced, and it requires severe concentration of the attention to

enable the average reader to comprehend it. Modern discussions of physical and dynamical questions make frequent use of terms which are not quite familiar to those whose studies of physics and mechanics were made many years ago. Many of these terms will be found very carefully and strictly defined in this work, which can be read in a few hours, though it will hardly be mastered in so short a time by men of average training not previously somewhat familiar with the subject.

Point Bridge.*

III.

Accompanying this number we give a double-page plate showing side and end elevation with plan and details of this bridge. Its total length is 1,245 feet from back to back of anchorages, with one middle span of 800 feet between centres of piers, and one independent trussed side span of 145 feet in length at each shore. The roadway rises from both shores toward the centre of the channel, with grades not exceeding $3\frac{1}{2}$ feet in 100—the highest point of the roadway being 83 feet above low water. The saddles upon which the chains rest on top of the towers are 180 feet above low water. The deflection of the chain is 88 feet, which is considerably more than is usual for suspension bridges, but the stiffening allows of increasing the deflection and thereby reduces the strains in the chains as well as their weight. The bridge is 34 feet wide from centre to centre of outside railings, and this space is divided into a roadway 21 feet wide and two sidewalks of $6\frac{1}{2}$ feet each.

The piers below the roadway floor are masonry built upon timber platforms (shown in fig. 1), sunk to a depth of about 12 feet below low water. The timber platform is 88 feet long and 34 feet wide for each pier, the masonry being 86 by 31 feet at the base and 54 by 25 feet at the top, built of the best quality of sandstone laid in cement mortar.

The anchor walls are built upon timber platforms also (figs. 1 and 4), resting upon a gravel bed about 5 feet below low water, the platforms being 81 feet long and 52 feet wide. The masonry below the roadway consists of two parallel walls, 16 feet thick at the base and 13 feet at the top, and 77 feet long, with two cross walls 14 feet thick, the space between the walls being filled with large stones. The anchor walls above the floor form two parallel walls (figs. 1 and 2), each 56 feet long, 10 feet wide and 22 feet high, inclosing the roadway. The appearance of this is shown in Plate II., published last week. The sidewalks are carried by iron brackets outside of these walls. The anchorages are similar to the ones used by Mr. Roebling's cable suspension bridges. The anchor chains (fig. 4) consist of hammered link-bars, 8 inches wide, and the lower links, being in a vertical position, are 17 feet long and connected by a six-inch pin to cast anchor-plates (figs. 5 and 6), of 8 by 10 feet, weighing 12,000 lbs. each. The upper links are ten feet long and placed in a curve to a point about 8 feet from the face of the masonry, where they connect with the back-chains. The heads of the link-bars rest upon wrought-iron plates fastened upon large stones, the anchor-chains being imbedded in cement grout.

THE TOWERS.

The towers are constructed of wrought iron entirely, except the bases of columns, and are built up of eight columns, each four columns being braced together for the purpose of supporting the chains, each column being 30 inches square, and having a sectional area of 64 square inches at the base and 54 square inches at the top. The caps (figs. 8, 9, 10 and 11) are formed of two box-girders five feet in depth, each resting on two columns, and having at the top, across from one girder to the other, five box-girders 17 in. deep, on which steel plates are fastened so as to form a bed for eighteen rollers (shown in figs. 8 and 9) $\frac{1}{4}$ in. in diameter and 51 in. long. On top of the rollers rest other steel plates, and on these are placed the saddles, consisting of twelve wrought-iron plates 26 in. wide and 2 in. thick, well braced together, the connection with the chain-links being made by pins 6 in. in diameter. The roadway of the bridge passes between the clusters of columns supporting the chains, and the sidewalks are located between the four columns on each side, as shown in Plate II. and also in fig. 3 of Plate IV. The two clusters of columns are braced together above the roadway by a substantial arch and a lattice girder in box shape 4 feet high and 20 in. wide, connecting the caps. Between the arch and the top lateral girders there is a double set of vibration rods $2\frac{1}{4}$ in. in diameter. The arch ways, cornices and turrets are made of heavy galvanized iron put up on strong iron frames, and are intended to give the towers an elaborate ornamental finish.

CHAINS AND STIFFENING TRUSSES.

The chain-links are 20 feet 6 in. long, from centre to centre of pins, the latter having a diameter of 6 in., and the links being 2 by 8 in., except where they bring only a single shear on the pins, when they are made 1 by 8 in. The width of heads is 16 in. The back chains either have twelve links each, the latter having a sectional area of 2×8 in., or eleven 2×8 in. links, and two of 1×8 in.; the sets thus alternating from 12 to 13 links in a set. Each back chain has, therefore, a sectional area of 192 square inches. The main chains are of fourteen and eleven links in a set, alternately, and near the centre line they are spared apart to receive the ends of posts and tie rods of the stiffening truss between them. The sectional area of the main chain decreases toward the centre, being 182 square inches near the towers, and 168 square inches at the centre. The difference in the sectional area of the main chains and the back chains arises from the different angle of inclination.

* We omitted to state that the engravings of the Point Bridge published in the two last numbers of the *Railroad Gazette* were made from some very excellent photographs taken by Mr. S. V. Albee, of No. 784 Fifth avenue, Pittsburgh. During the erection of the bridge he took a series of views showing the appearance of the structure at various stages of its progress.

The top chords of the stiffening truss, which is 22 feet high in the centre, are composed of channels and plates, forming a rectangular section 22 in. wide by 13 in. deep, with full tension splices. The top and centre joint connections are made by forged bars 12 in. wide, having a head on one end, the other end being riveted to the chord. The last sections of the top chords near the centre were not put in place until the whole bridge was finished, the correct length of the chords being thereby insured, thus preventing the stiffening trusses from being strained by dead weight.

The posts of the towers are constructed of I beams and plates, all tie rods being double and of the same size, each 1½ in. square, and being provided with turnbuckles for adjustment. The posts and tie-rods are connected by pins at both ends. There are lateral struts and diagonal rods between chains and top chords in each panel, except near the centre of the bridge, proportioned so as to resist the effects of wind pressure. Vibration rods are placed between the chords and chains, so as to transmit unequally distributed loads upon the roadway and sidewalks, evenly over both chains and trusses. This arrangement prevents the bridge from oscillating crossways—a motion readily noticed in other suspension bridges whenever loads pass on one side of the roadway only.

ROADWAY.

The roadway girders are 8 ft. high and are placed outside of the sidewalks, their upper part forming a hand railing. They are lattice girders, proportioned to sustain the load of two panels of 20 ft. each. They are built continuous in lengths of 100 ft., and are jointed together in such a manner as to allow free expansion and contraction of the iron work. The trusses are suspended from the chains by iron rods of 1½ in. diameter placed in pairs every 20 ft., and by posts at the expansion joints to form rigid connections at these places. Iron cross girders 3 ft. in depth connect these roadway trusses every 20 ft. and support two intermediate lines of iron stringers. These stringers and the roadway trusses

form the bearers across which are placed the wooden joists for the flooring. The roadway consists of two courses of 2½ in. oak planks, the lower course being laid diagonal and the upper lengthways to the bridge. Two street-car tracks are constructed on the floor. The sidewalks are laid with narrow 3 in. planks of southern pine. The lateral stiffness of the floor is secured by a double system of tie-rods and the wind pressure is taken up by four horizontal steel wire cables of 2½ in. diameter placed under and fastened to the floor, the cables being anchored to the pier masonry. The sidewalks are separated from the roadway by an iron hand-railing, and gas lamps are placed at intervals of 100 ft. The houses at each end of the bridge are built in continuation of the upper anchor-walls.

STRENGTH OF THE BRIDGE.

The bridge is calculated for a moving load of 50 lbs. per square foot of flooring for the trusses, towers and chains, and for 70 lbs. per square foot for the floor system and suspenders. The maximum stresses allowed are six tons per square inch in the chains, 4½ tons in the towers, 4 tons in the suspenders, and 6 tons for tension and 5 tons for compression in the upper chords of the stiffening trusses. The maximum strains in the different parts were calculated under the following conditions of load, viz.:

Main chains with bridge fully loaded.

Towers, with bridge fully loaded and a wind pressure of 30 lbs. per square foot on the chains, trusses and towers, and also with no load on the bridge and a wind pressure of 50 lbs. per square foot upon the structure.

Top chords of stiffening trusses with moving load only, they being subjected to tensile as well as compressive strains. Maximum tension in section near the centre joint was calculated with a load on half the span beyond the centre joint; for the section near the tower it was calculated with a load over about two-thirds of the span commencing from the opposite tower. For the other top-chord sections the maxima occur under a load covering

the opposite half span and advancing beyond the centre until it covers about two-thirds of the whole span. The maximum compression in each top-chord section was determined under the condition of the bridge being relieved from the load which brings the maximum tension and loaded over the space which was assumed to be unloaded for the calculation of maximum tension.

Posts and tie-rods were also calculated for moving loads only. The load on one side of the centre joint does not bring any strains upon the posts and tie-rods of the truss opposite. All main and counter ties are subjected to tensile strains. The maximum strain for tie-rods leaning from the chain pins toward the centre will be caused by a load covering the space from the tower up to the tie-rod. For rods leaning toward the tower it will be caused by a load from the centre up to the rod in question. The posts and diagonals will receive additional strains from changes of shape of trusses, which, however, are small. Still they were considered and approximately provided for by making the sizes of the diagonal rods all alike, although the strains from the load vary. The straight top-chords will also be subjected to strains when the bridge is fully covered by a movable load, on account of change of form, but the other and maximal strains upon the same having previously been provided for their consideration became superfluous.

The stability of the structure under wind pressure is secured as follows: Wind pressure with upward tendency is resisted by the weight of the floor, and also by the whole weight of the chains and stiffening trusses by means of the vertical posts connecting the floor trusses and the chain. Wind pressure sideways against the chains and stiffening trusses is resisted by lateral bracing between them and is carried to the top of the towers, which again are braced and proportioned to transmit it to their bases. Wind pressure sideways against the roadway is transferred to the stone piers by the cables and the bracing beneath the floor.

Next week will be given engravings and description of the method of erecting this structure.

RAILROAD EARNINGS IN FEBRUARY.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.		
	1878.	1877.	Inc.	Dec.	Per c.	1878.	1877.	Increase.	Decrease.	Per c.	1878.	1877.	
Atchison, Topeka & Santa Fe.	786	711	75		10.5	\$185,500	\$136,350	\$49,150		36.0	\$236	\$192	
Burl'gton, Ced. Rapids & North.	424	368	56		15.2	147,196	68,094	79,102		116.3	347	185	
Cairo & St. Louis.	146	146				13,048	22,075		9,027	40.8	89	151	
Central Pacific.	1,878	1,660	218		13.1	974,000	945,171	28,829		3.0	519	569	
Chicago & Alton.	678	678				288,966	325,047		26,081	8.0	441	479	
Chicago, Milwaukee & St. Paul.	1,414	1,402	12		0.9	668,000	403,880	264,120		65.3	472	288	
Chicago & Northwestern.	1,993	1,993				1,062,013	779,057	282,956		36.2	533	391	
Cleveland, Mt. Vernon & Del.	157	157				26,812	25,246	1,566		6.2	171	161	
Dakota Southern.	78	78				15,069	9,467	5,602		64.7	200	122	
Denver & Rio Grande.	304	269	35		13.0	55,065	40,182	14,883		37.0	181	149	
Houston & Texas Central.	505	505				205,883	189,601	16,282		8.6	408	375	
Illinois Central, Illinois lines.	819	707	112		15.8	375,656	358,966	16,790		4.7	459	508	
Iowa lines.	402	402				124,371	100,257	24,114		24.0	302	249	
Indianapolis, Bl'm'gton & West.	343	343				93,160	93,176			16	272	272	
International & Great Northern.	516	516				109,939	136,055		26,116	19.2	313	264	
Kansas Pacific.	673	673				179,453	181,094			1.641	0.9	267	269
Missouri, Kansas & Texas.	786	786				181,118	235,309		54,191	23.0	220	220	
Missouri Pacific.	426	426				279,866	265,339	14,527		5.5	657	623	
Nash'ile, Chattan'ga & St. Louis	349	341	8		2.3	155,771	148,494	7,277		4.9	446	435	
New Jersey Midland.	85	85				38,329	42,631		4,302	10.1	451	502	
Paducah & Elizabethtown.	185	185				26,673	26,551	122		0.5	144	143	
Paducah & Memphis.	115	115				17,615	15,508	2,107		13.6	153	135	
Philadelphia & Erie.	288	288				180,507	198,402		17,895	9.0	627	689	
St. Louis, Alton & Terre Haute (Belleville Line).	71	71				35,008	36,789		1,781	4.8	493	518	
St. Louis, Iron Mt. & Southern.	685	685				341,900	352,407		10,507	3.0	499	514	
St. Louis, Kansas City & North'n.	530	530				234,661	231,677	2,984		1.3	443	437	
St. Louis & San Francisco.	328	328				82,145	106,049		23,904	22.6	250	323	
St. Louis & Southeastern.	354	354				83,130	81,472	1,658		2.0	235	230	
St. Paul & Sioux City.	122	122				41,341	29,409	11,932		40.6	339	241	
Sioux City & St. Paul.	148	148				28,176	17,554	10,622		60.4	190	119	
Southern Minnesota.	170	170				61,759	31,942	30,717		99.1	363	183	
Toledo, Peoria & Warsaw.	237	237				94,878	80,379	14,499		17.7	400	340	
Wabash.	688	628	60		9.6	311,309	332,510		21,201	6.4	452	529	
Totals.	16,683	16,107	576		3.6	\$6,728,857	\$6,045,340	\$680,179	\$196,632		\$403	\$375	
Total increase.			576		3.6			683,517		11.3			

RAILROAD EARNINGS, TWO MONTHS, ENDING FEBRUARY 28.

NAME OF ROAD.	MILEAGE.					EARNINGS.					EARNINGS PER MILE.				
	1878.	1877.	Inc.	Dec.	P. c.	1878.	1877.	Increase.	Decrease.	P. c.	1878.	1877.	Inc.	Dec.	P. c.
Atchison, Top. & S. Fe.	786	711	75	.....	10.5	\$356,500	\$271,214	\$85,286	.....	31.4	\$454	\$381	\$73	.....	19.2
Burlington, Cedar Rapids & Northern.	424	368	56	.....	15.2	312,608	142,058	170,550	.....	120.0	737	386	351	.....	90.9
Cairo & St. Louis.	146	146	.....	.....	.....	24,015	40,277	.....	\$16,262	40.4	164	276	.....	\$112	40.4
Central Pacific.	1,878	1,660	218	.....	13.1	2,099,000	2,115,786	.....	16,786	0.8	1,118	1,275	.....	157	12.3
Chicago & Alton.	678	678	.....	.....	.....	615,677	676,655	.....	60,978	9.0	908	998	.....	90	9.0
Chicago, Milwaukee & St. Paul.	1,414	1,402	12	.....	0.9	1,374,000	779,433	594,567	.....	70.5	972	550	416	.....	74.8
Chicago & Northwestern.	1,993	1,993	.....	.....	.....	2,139,004	1,586,783	552,221	.....	34.9	1,074	796	278	.....	34.9
Cleveland, Mt. V. & Del.	157	157	.....	.....	.....	55,068	52,145	2,923	.....	7.3	356	332	24	.....	7.3
Dakota Southern.	78	78	.....	.....	.....	30,682	17,964	12,697	.....	70.5	393	230	163	.....	70.5
Denver & Rio Grande.	304	269	35	.....	13.0	115,236	82,040	33,226	.....	40.5	379	305	74	.....	24.3
Grand Trunk.	1,389	1,389	.....	.....	.....	1,601,062	1,452,181	148,881	.....	10.3	1,153	1,045	108	.....	10.3
Great West. of Canada.	511	511	.....	.....	.....	853,507	624,423	229,084	.....	33.5	1,631	1,222	409	.....	33.5
Illinois Cen., Ill. lines.	819	707	112	.....	15.8	839,914	736,267	103,647	.....	13.6	1,026	1,027	.....	1	0.1
Iowa lines.	402	402	.....	.....	.....	232,763	193,512	39,251	.....	30.6	629	481	148	.....	30.6
Ind., Bloom. & Western.	343	343	.....	.....	.....	213,478	185,344	28,134	.....	15.2	623	540	83	.....	15.2
International & Gt. Nor.	516	516	.....	.....	.....	244,823	310,068	.....	65,245	21.0	474	601	.....	157	21.0
Kansas Pacific.	673	673	.....	.....	.....	368,909	357,359	11,550	.....	3.2	548	531	17	.....	3.2
Missouri, Kan. & Tex.	786	786	.....	.....	.....	398,147	472,341	.....	74,194	15.7	507	601	.....	94	15.7
Missouri Pacific.	426	426	.....	.....	.....	574,677	531,242	43,435	.....	8.2	1,349	1,247	102	.....	8.2
Nashville, Chat. & St. L.	349	341	8	.....	2.3	333,577	298,960	34,617	.....	11.6	956	877	79	.....	9.0
New Jersey Midland.	85	85	.....	.....	.....	90,601	92,835	3,766	.....	4.1	1,136	1,092	44	.....	4.1
Paducah & Memphis.	115	115	.....	.....	.....	34,161	30,618	3,543	.....	11.6	297	266	31	.....	11.6
Philadelphia & Erie.	288	288	.....	.....	.....	401,003	430,952	.....	29,949	6.9	1,392	1,496	.....	104	6.9
(Bellefonte Line).	71	71	.....	.....	.....	74,850	88,159	.....	13,309	15.1	1,054	1,241	.....	187	15.1
St. Louis, Iron Mt. & So.	685	685	.....	.....	.....	731,300	729,610	1,690	.....	0.2	1,068	1,065	3	.....	0.2
St. Louis, K. C. & Nor.	530	530	.....	.....	.....	499,290	471,711	27,579	.....	5.8	942	890	52	.....	5.8
St. Louis & San Fran.	328	328	.....	.....	.....	179,687	206,536	.....	26,849	13.0	548	629	.....	81	13.0
St. Louis & Southeastern.	354	354	.....	.....	.....	160,097	172,729	.....	3,632	2.1	478	488	.....	10	2.1
St. Paul & Sioux City.	122	122	.....	.....	.....	121,775	121,775	.....	.....	.....	671	492	179	.....	36.3
Sioux City & St. Paul.	148	148	.....	.....	.....	54,135	33,078	21,059	.....	63.8	396	226	140	.....	63.8
Southern Minnesota.	170	170	.....	.....	.....	121,775	67,563	54,210	.....	80.2	716	397	319	.....	80.2
Toledo, Peoria & War.	237	237	.....	.....	.....	225,344	159,149	66,195	.....	41.6	951	672	279	.....	41.6
Wabash.	688	628	60	.....	9.6	608,217	650,009	48,208	.....	7.4	1,015	1,035	.....	20	1.9
Totals.	17,893	17,317	576	.....	3.3	\$16,115,755	\$14,109,007	\$2,349,952	\$307,304	14.6	\$903	\$815	\$88	.....	10.8
Total increase.	.....	.....	576	.....	3.3	.....	.....	2,042,748	.....	14.6	.....	.....	.....	.....	.....

Transportation in Congress.

In the Senate on the 20th: The consideration of the Pacific railroad sinking fund bill was resumed, and

Mr. Mitchell, of Oregon, argued in favor of the Railroad Committee bill, and condemned the Judiciary Committee bill as unjust and unconstitutional.

In the House on the 20th: Mr. Muldrow, of Mississippi, introduced a bill to aid in the construction of the Ship Island, Ripley & Kentucky Railroad. Referred.

In the Senate on the 22d: Mr. McDonald, of Indiana, spoke on the Pacific Railroad sinking fund bill, advocating that reported by the Judiciary Committee.

In the House on the 22d: The Senate bill to authorize the Worthington & Sioux Falls Railroad Company to extend its road into the Territory of Dakota to the village of Sioux Falls was taken up and passed.

Mr. Hunton, of Virginia, introduced a bill to organize a system of superintendence of railroads. Referred.

Nearly every day following the discussion of the Pacific railroad sinking fund bill has been resumed, but a vote is not expected before the beginning of next week.

In the Senate on the 27th: Discussion on the Pacific Railroads sinking fund bill was resumed, and

Mr. Hill, of Georgia, argued that the bill of the Judiciary Committee was unconstitutional.

Mr. Thurman, of Ohio, gave notice that he would ask for a vote on the bill next Wednesday.

a large enterprise in Southern Russia. He will shortly return to St. Petersburg. While in this country Mr. Bary was engaged in bridge building, and also had charge of iron construction on the Centennial buildings in Philadelphia.

—An old and faithful employé of the Central Railroad of New Jersey died recently in Elizabeth, N. J. Richard Staats, a colored man, familiarly known as Black Dick, had served the company for 36 years, and for 25 years past had had charge of the switches at the junction of the main line and the branch leading to the Elizabethport coal docks. The old man had become a sort of landmark, and for many years the junction where he presided has been known as "Dick's Switches," both on the road and in the town. He was noted for his faithfulness and strict attention to duty, and no accident was ever traced to any disarrangement of the complicated system of switches under his charge.

—Wm. D. Judson, formerly President of the Chicago, Danville & Vincennes Company, has filed a voluntary petition in bankruptcy in New York. His liabilities are over \$350,000; his assets consist chiefly of \$25,000 first-mortgage and \$400,000 chattel mortgage bonds of the Chicago, Danville & Vincennes, and an interest in a claim of \$588,536 against the company. As the road has been sold under foreclosure these have little or no value.

—Mr. W. H. Morse has resigned his position as President of the Boston, Barre & Gardner Railroad Company.

ELECTIONS AND APPOINTMENTS.

Boston & Albany.—No appointment will be made of Master Car Builder to succeed Mr. Wm. E. Chamberlain, who was lately appointed Superintendent of the Providence & Worcester road; but Master Car Builder F. D. Adams will hereafter have charge of the whole road, including the Allston shops as well as those at Springfield.

Burlington, Keosauqua & Western.—This company has been permanently organized with the following directors: George L. Epps, Denmark, Ia.; Henry Hill, Augusta, Ia.; Henry Cameron, Union, Ia.; J. M. Gregg, Danville, Ia.; E. P. Howard, Edward Manning, Keosauqua, Ia.; Judge Mason, L. H. Dalhoff, John S. David, E. Chamberlain, S. H. Jones, David Leonard, J. G. Foote, A. G. Adams, Burlington, Ia. The board elected the following officers: David Leonard, President; Judge Mason, Vice-President; E. Chamberlain, Treasurer; J. A. Giles, Secretary.

Chicago & Alton.—Mr. M. J. Scraftford, of Chicago, has been appointed Assistant General Solicitor.

Chicago, Burlington & Quincy.—At the annual meeting in Chicago, March 27, the following directors were chosen: C. E. Perkins, Burlington, Ia.; R. Harris, J. M. Walker, Chicago; Peter Geddes, J. L. Gardner, Jr., New York; J. N. A. Griswold, Newport, R. I.; J. M. Forbes, Sidney Bartlett, C. J. Paine, T. J. Coolidge, C. Cunningham, Boston. The new directors are Messrs. Cunningham and Gardner, who succeed W. J. Rotch and John N. Denison.

Chicago, Clinton, Dubuque & Minnesota.—The general offices of this company, formed by the consolidation of the old Chicago, Clinton & Dubuque and Chicago, Dubuque & Minnesota companies will remain at Dubuque, Iowa, and mileage, freight and ticket balances should be reported and sent to C. M. Carter, Assistant Treasurer, at that place, as heretofore.

Cleveland, Columbus, Cincinnati & Indianapolis.—At a recent meeting Mr. E. B. Thomas was appointed General Manager, a new office on this road. Mr. Flint will remain General Superintendent as heretofore, Mr. Thomas taking the general direction and supervision of the business and operation of the road. Of Mr. Thomas the *Cleveland Herald* says: "He has lived in this city during the greater portion of his life, and has long been well known as a young man of large business experience, unquestioned integrity, and the most indomitable energy. About 1860 he became prominently associated with Mr. C. A. Otis in the management of one of the heaviest iron interests in the city, and this connection he maintained until his appointment by the United States Circuit Court, as Receiver of the Tuscarawas Valley road. This post he filled with such noticeable energy and discretion that upon the reorganization of that company under the name of the Cleveland, Tuscarawas Valley & Wheeling he was, by the unanimous wish of the owners of the road, invited to take the position of its General Manager. It is enough to say as to the manner in which Mr. Thomas acquitted himself of this charge, that under his administration the property of the company has steadily and substantially increased in value, and that the business of the road has considerably more than doubled. It is undoubtedly to this signal success that Mr. Thomas owes the invitation to step up higher, which he has just received."

Cleveland, Tuscarawas Valley & Wheeling.—The board has re-elected the old officers, as follows: President, Selah Chamberlain; General Manager, E. B. Thomas; Secretary, Treasurer and Auditor, P. A. Hewitt. Mr. Thomas, however, has since resigned to accept another position as noted elsewhere.

The following circular is dated March 21: "E. B. Thomas, General Manager of this company, has resigned, to take effect Saturday, March 23, 1878. For the present, communications and reports heretofore made to him, should be addressed to W. W. Card, Superintendent and Chief Engineer."

Denver & Rio Grande.—Mr. Wm. M. Hastings has been appointed Assistant General Freight Agent. Mr. John Pratt has been appointed Purchasing Agent, with office at Colorado Springs, Col. The duties of that office have heretofore been performed by Mr. R. F. Weitbrecht, the Treasurer.

Grand Southern.—At the annual meeting in St. George, N. B., March 21, the following directors were chosen: A. H. Gillmor, Jr., Samuel Johnson, J. A. Moran, W. K. Reynolds, K. P. Gillmor, C. McGee, R. A. Stuart.

Missouri River, Fort Scott & Gulf.—By an order of the Circuit Court of the United States for the District of Kansas, made March 16, 1878, Mr. George H. Nettleton was appointed Receiver, and has qualified and taken possession of all the railroad and other property of the Missouri, Fort Scott & Gulf Railroad Company. Reports of the operating department will be made through the following officers: B. S. Henning, General Superintendent; C. H. Prescott, Cashier and Auditor; J. N. Watkins, General Freight Agent; J. E. Lockwood, General Ticket Agent; J. S. McCrum, Master Mechanic; J. M. Buckley, Road Master.

Ohio River.—This company was organized at Ironton, O., by the election of the following directors: George D. Chapman, John G. Peebles, John Means, T. W. Means, J. S. Fulson, George Willard, John Campbell, Cyrus Ellison, William D. Kelly. The board chose officers as follows: President, George D. Chapman, Columbus, O.; Vice-President, John G. Peebles, Portsmouth, O.; Secretary, C. O. Hunter; Treasurer, John Means, Ashland, Ky.; Chief Engineer, Joel Huntcoop; Attorney, W. G. Hutchins.

Pennsylvania.—At the annual election in Philadelphia, March 28, the following directors were chosen: Thomas A. Scott, Josiah Bacon, Wistar Morris, John M. Kennedy, Samuel M. Felton, Alexander Biddle, N. Parker Shortridge, Henry M. Phillips, D. B. Cummins, Henry D. Welsh, all of

Philadelphia. This is the ticket nominated by the committee and has two new directors, Messrs. Cummins and Welsh, who succeed Mr. A. J. Derbyshire, of Philadelphia, and John Scott, of Pittsburgh. There was no organized opposition, but, out of 481,184 votes there were 66,652 cast for Thomas Potter and 46,314 for A. J. Derbyshire, who were not on the regular ticket.

The board re-elected Thomas A. Scott, President; George B. Roberts, Vice-President; Edmund Smith, Second Vice-President; A. J. Cassatt, Third Vice-President; Joseph Lesley, Secretary; John C. Sims, Jr., Assistant Secretary.

Philadelphia & Atlantic City.—A statement has been circulated that Mr. F. V. Robinson had been appointed General Superintendent, which is not correct, no such appointment having been made. The officers of the road are: C. R. Colwell, President; J. H. Burrell, Jr., Secretary and Treasurer; C. H. Brown, General Superintendent.

Port Huron & Northwestern.—This company was recently organized by the election of the following directors: Daniel B. Harrington, John P. Sanborn, Charles R. Brown, James Beard, Silas L. Ballentine, Henry Howard, William Hartsuff, Henry McMorran, Peter B. Sanborn. The board elected Daniel B. Harrington President; Henry Howard, John P. Sanborn, Vice-Presidents; Charles R. Brown, Secretary and Attorney; Frederick L. Wells, Treasurer. Office at Port Huron, Mich.

Union Pacific.—The names of the five Government directors for the ensuing year as finally announced are: Charles Francis Adams, Jr., of Massachusetts; Daniel Chadwick, of Connecticut; Ralph P. Buckland, of Ohio; G. W. Smythe, of Iowa; C. C. House, of Nebraska. The list differs from that published last week only in the substitution of Mr. House for R. P. Wilbur, of Nebraska.

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Dec. 31:

	1877.	1876.	Inc. or Dec.	P. c.
Maine Central.....	\$1,654,237	\$1,731,933	D.	\$77,696 4.5
Expenses.....	1,003,538	1,042,082	D.	38,544 3.7
Net earnings.....	\$650,699	\$689,851	D.	\$39,152 5.7
Earnings per mile.....	4.600	4.879	D.	.279 6.0
P. c. of expenses.....	60.66	60.17	L.	0.49 0.8

Month of December:

	1877.	1876.	Inc. or Dec.	P. c.
Col., Chi. & Ind. Cen.	\$291,073	.....	.....	.....
Net earnings.....	53,811	.....	.....	.....
P. c. of expenses.....	81.53	.....	.....	.....
Erie.....	1,465,133	\$1,157,416	L.	\$307,717 26.6
Net earnings.....	461,259	174,484	L.	286,775 154.0
P. c. of expenses.....	68.52	84.93	D.	16.41 19.3

Two months ending Feb. 28:

	1877.	1876.	Inc. or Dec.	P. c.
Denver & Rio G.....	\$115,191	\$82,040	L.	\$33,151 40.4
Net earnings.....	36,707	32,037	L.	4,670 14.6
P. c. of expenses.....	68.13	60.98	L.	7.15 11.7
Philadelphia & Erie.....	401,003	430,952	D.	29,949 0.9
Net earnings.....	130,117	124,534	L.	5,583 4.5
P. c. of expenses.....	65.06	71.09	D.	6.03 8.5
St. L. & Southeast.....	108,692	171,021	D.	62,329 1.4
Net earnings.....	28,291	36,651	D.	8,360 22.8
P. c. of expenses.....	83.08	78.58	L.	4.50 5.7
Wabash.....	608,217	650,009	L.	41,792 7.4
Net earnings.....	102,721	85,530	L.	17,191 90.3
P. c. of expenses.....	70.69	86.84	D.	16.15 11.7

Month of February:

	1877.	1876.	Inc. or Dec.	P. c.
Philadelphia & Erie.....	\$180,507	\$198,402	D.	\$17,895 9.0
Net earnings.....	48,142	48,206	D.	64 0.1
P. c. of expenses.....	73.13	75.70	D.	2.57 3.4
Rock Isl'd & Peoria.....	32,347	.....	.....	.....
Net earnings.....	15,802	.....	.....	.....
P. c. of expenses.....	50.96	.....	.....	.....

Second week in March:

	1877.	1876.	Inc. or Dec.	P. c.
Denver & Rio G.....	\$13,373	\$11,002	L.	\$2,371 21.6
St. L., I. Mt. & So.....	94,800	92,964	L.	1,836 2.0

Week ending March 15:

	1877.	1876.	Inc. or Dec.	P. c.
Great Western, of Canada.....	\$83,702	\$73,812	L.	\$9,890 13.4

Week ending March 16:

	1877.	1876.	Inc. or Dec.	P. c.
Grand Trunk.....	\$174,785	\$162,436	L.	\$12,349 7.6

Grain Movement.

Receipts and shipments of grain of all kinds for the week ending March 16 were, in bushels:

	1877.	1876.	Inc. or Dec.	P. c.
Northwestern receipts.....	2,377,784	1,195,040	1,182,744	99.0
Shipments.....	2,586,123	698,134	1,887,989	267.6
Atlantic receipts.....	3,385,861	1,721,935	1,663,926	96.6

The Northwestern receipts are less the previous week, the Northwestern shipments the largest of the winter and, moreover, the largest rail shipments on record. The Atlantic receipts were about the average of the winter. The latter were distributed among the several ports as follows: New York, 45.3 per cent.; Baltimore, 20.1; Philadelphia, 16.5; New Orleans, 6.6; Boston, 6; Portland, 1.4, and Montreal, 0.1 per cent. The stocks at the Northwestern markets are extraordinarily small for the season, and would hardly make more than two or three weeks' shipments at the rate the railroads are now carrying.

Coal Movement.

Coal tonnages for the week ending March 16 are reported as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Anthracite.....	108,418	295,392	D.	186,974 63.3
Semi-bituminous.....	42,778	36,808	L.	5,970 16.2
Bituminous, Pennsylvania.....	36,407	27,814	L.	8,593 30.9

All the miners in the Cumberland region, except those of the Consolidation Company, have decided to go to work at 40 cents per ton. It is not probable that there will be any reduction in prices at tide-water, however, as the expected increase in freights will more than balance the reduction in wages.

Coal receipts at Chicago last year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Chicago & Alton.....	283,213	293,807	D.	10,594 3.6
Chicago & Eastern Illinois.....	178,146	196,865	D.	18,719 9.5
Pitts., Cincinnati & St. Louis.....	105,012	106,774	D.	1,762 1.6
Pitts., Ft. Wayne & Chicago.....	102,241	142,097	D.	40,456 28.4
Lake Shore & Mich. South.....	78,078	55,206	L.	22,772 43.1
Other railroads.....	187,914	106,827	L.	81,087 75.9
Canal.....	8,828	5,292	L.	3,536 68.8
Lake.....	804,759	711,572	L.	93,187 13.1
Total.....	1,749,091	1,619,039	L.	130,052 8.0

The rail receipts may be divided as follows: From south and west of Chicago, 578,463 tons; from east of Chicago, 357,041 tons. The latter and the lake receipts are chiefly anthracite and gas coal. Shipments from Chicago in 1877 (chiefly of coal received by lake) were 271,176 tons, of which the Chicago & Northwestern took 162,053 tons, the Chicago, Burlington & Quincy, 44,416, the Chicago, Rock Island & Pacific, 18,015, the Illinois Central, 16,945, and the rest was divided among the other roads, no one taking more than 10,000 tons. The lake shipments were only 1,086 tons.

East-Bound Freight Rates.

A dispatch from Chicago, March 21, says that at a meet-

ing held that day the managers of the Chicago & Alton, the Wabash and the Vandalia Line agreed that east-bound rates from St. Louis should be put upon the basis of the present contracts from Chicago, which expire March 31, when it is expected that tariff rates will be restored and maintained. The two other St. Louis roads were not represented at the meeting, but are expected to take similar action.

A St. Louis dispatch of March 21 says: "East-bound freight rates have been cut again here, 40 cents having been freely offered on flour to New York to-day, and 25 cents per hundred on grain."

East-Bound Freight Apportionment.

A dispatch from Chicago, March 26, says: "The representatives of the leading eastern lines met to-day, and after dividing into committees and examining figures on freight shipped over their lines during late years, agreed upon a percentage of apportionment of freight to each road which it should carry out of St. Louis, Indianapolis, Chicago and Cincinnati and intervening points. The schedule will be completed, and it is believed with entire harmony."

A further dispatch dated March 27 says: "The railroad managers and agents of the trunk lines adjusted their differences in to-day's meeting. They completed their apportionment of freight, and constituted grain as a special class of freight, fixing the rate on the basis of 25 cents from Chicago to New York, and retaining the rate of 30 cents for fourth-class freight. The nominal rate for grain has hitherto been 30 cents."

Lake Rates.

The first quotations of the year are 3 cents per bushel for wheat, and 2½ to 2¾ for corn, from Chicago to Buffalo; 10 cents per barrel for salt from Bay City to Chicago and Milwaukee. There is already some movement of lumber vessels which make comparatively short trips, but grain vessels are not expected to leave until about April 1.

THE SCRAP HEAP.

Railroad Manufactures.

The New York Elevated Railroad has given an order for 20 new engines, which is divided, 10 being given to the Baldwin Locomotive Works at Philadelphia, and 10 to the Rhode Island Locomotive Works at Providence. Ten of the engines are to be four-wheel outside-connected, with saddle tanks, and 10 will be eight-wheel engines of the Forney pattern.

The Grant Locomotive Works, at Paterson, N. J., have an order for five engines for the Gilbert Elevated road, in addition to those they are already building.

The Wason Car Works, at Chattanooga, Tenn., are building some cars for the Southern States Coal, Iron & Land Co. A French & Co., at Pittsburgh, Pa., are making 500 sets of freight elliptical springs for the Pennsylvania Company, and 100 for the Chicago & Alton.

The Culmer Spring Co., at Pittsburgh, is running its works extra time, having some heavy orders to fill for steel spiral springs.

Riehle Brothers, of Philadelphia, are building a new weigh-lock scale at Harrisburg, Pa., for the Pennsylvania Canal.

The rolling mill at Erie, Pa., now owned by Wm. L. Scott, is to start up soon on a contract to re-roll rails for the Lake Shore road.

Ferrol Furnace, in Augusta County, Va., will go into blast in April, using local ores and New River coke from West Virginia.

The Wakefield Rattan Co., of Boston, is making its patent cane seats for 35 passenger cars.

The Goderich Foundry Co., at Goderich, Ont., is making a lot of car wheels for the Canadian Pacific road.

The Ontario Car Works, at London, Ont., have an order for 70 cars for the Canadian Pacific road.

The Kellogg Bridge Co., of Buffalo, N. Y., has orders on hand for 2,000 tons of bridge work. The company recently secured the contract for the Beaver Switch bridge on the St. Louis & San Francisco road.

In addition to contracts already noted, Morrison, Field & Co., of Buffalo, N. Y., have orders for five spans of 105 feet each for the Kansas City, St. Joseph & Council Bluffs; one span of 145 and one of 155 feet for the Missouri River, Fort Scott & Gulf, and roofs for two round-houses for the Chicago, Burlington & Quincy.

The Vulcanized Fibre Co., of Wilmington, Del., has recently filled large orders for fish-bolt washers for the Chicago, Burlington & Quincy, the Missouri Pacific, and other roads.

The Eames Vacuum Brake Co., at Watertown, N. Y., is to put its brakes on the trains of the Boston, Revere Beach & Lynn and the Kentucky Central roads.

Steam Street Cars.

The Philadelphia Times of March 22 says: "Yesterday was the first anniversary of the placing of steam street cars on the Market street line as an experiment. During the year seven of these cars—six of the Ramson patent and one Baldwin—have been run. It has been demonstrated that a steam car can be run for a year for about \$600 less than the total cost of running a horse car, and although the fare on the former has been five cents and on the latter six cents, the steam car has earned as much money as the horse car. During cool weather the steam car has earned more money than the horse car, but the reverse was true during hot weather, owing to imperfect ventilation. To obviate this a new system of ventilation is to be adopted which, it is claimed, will make the steamer as cool in summer as the horse car, and it will be so arranged that in winter the passenger can have the benefit of the heat from the engine. No serious accident has occurred from the use of the steam cars. Owing to the fact they have been run at intervals between horse cars, no improvement in speed has been possible, but it is claimed that if the horse cars were out of the way double the speed could be had with safety."

The Rubber Car Step Patents.

In the case of Brown and others against the Rubber Step Manufacturing Co. and others, the United States Circuit Court for Massachusetts has decided that the rubber car steps are not an infringement of the Chaffee patent for rubber door-mats. The essence of that patent is the use of flexible rubber ridges to act as scrapers in removing the dirt, and to form recesses or chambers to receive the dirt, while the car steps are merely provided with projections to prevent the foot from slipping and the spaces are left open to form channels by which mud or water may run off. The Court says, in conclusion:

"The function of the Chaffee mat is to present to the foot elastic, resilient ridges, over which the foot may easily slide, that the ridges may act in place of brushes 'as scrapers to clean the feet,' and also to present convenient cells or spaces 'to hold the dirt' thus removed. The function of the defendants' contrivances is to present to the foot a frictional bearing to prevent sliding or slipping, for the foot to rest firmly on, not to be scraped over, and grooves or gutters or depressions, not 'to contain dirt,' but to prevent it from being retained, and to facilitate the removal of mud, water and ice."

"The two contrivances do not perform the same function

by the same means, and the defendants' products are unfit for the use for which the complainants' products are intended, and the complainants' products are unfit for use for the purposes for which the carriage and car steps of the defendants are manufactured. There is no evidence of infringement by the defendants, and the bill of complainants is dismissed with costs.

In the suit of the Rubber Step Manufacturing Co. against the Metropolitan Railroad Co. and others, in the same Court, after referring to the above case, the Court says:

"The Keene invention consists in covering the tread of a carriage step with a vulcanized rubber clothing, having an undulating surface whereby projections of rubber are presented upward to receive the pressure of the foot, and also in providing a permanent surface to the step resilient under the foot, the coating of rubber being somewhat adhesive to the foot, thereby having a tendency to prevent slipping in either dry or wet weather; and in snowy or sleety weather, when trodden upon, adhering ice or snow is broken by the yielding of the rubber projections under pressure, and loosened upon the removal of the pressure of the foot, by reason of the resiliency of the rubber, so as to be readily brushed off.

"The fact that rubber had been used as a soling to stirrups, and applied to shoe soles, does not establish any anticipation of this invention. The use of iron treads, with channels running to the margin, for door-steps and stairs, or for carriage steps, did not anticipate this invention. The metal projections became slippery instead of adhesive to the foot by wear, and their was no resiliency, under the pressure of the foot, to effect the removal of the snow and ice. The rejected application for a patent of Charles Ray is not of itself a bar to the patent to Keene, there being no evidence in the case that the alleged prior invention of Ray was ever perfected or brought to actual use, and not abandoned and never revived by the original inventor. Decree for injunction and account as prayed for in the bill."

Long Runs without Repairs.

We published recently an extract from the Port Jervis *Gazette* concerning the running of locomotive No. 321 on the Erie Railway in charge of John Kinsila. It had run 88,800 miles "without being repaired in the least except the ordinary 'running repairs,' such as reducing brasses in side and main rods, etc."

Referring to this a correspondent writes from the Cleveland shops of the Lake Shore & Michigan Southern Railway as follows:

"Lake Shore & Michigan Southern Railway engine 359 came from the shop, having undergone thorough repairs, Feb. 10, 1875, and came in for new flue sheet (otherwise could have run a year longer). Nov. 21, 1877, having run on the heaviest passenger trains of the road—Nos. 4 and 5, between Cleveland and Erie—two years, eight months and eleven days, making 89,770 miles. She ran one year, three months and five days, making 39,829 miles, without having her valves faced, and ran one year, eleven months and seventeen days, making 63,329 miles, without taking down her side rods. Her average mileage to one pint of oil was 24.63 miles. She has hauled one car 912,371 miles at a cost per car per 100 miles for repairs of 39.95 cents. Engineer Nick Hartman (known as the Flying Dutchman) has had her since she came on the road."

The statement concerning the Lake Shore engine is praise worthy for its definiteness. A comparison is of comparatively little value unless we know what the engine has hauled as well as the mileage it has made. But even this is not sufficient without a knowledge of the grades and curves of the road and the condition of the track, and the speed at which the engine was run.

Another correspondent referring to the item from the Port Jervis *Gazette* respecting the run of 88,800 miles without repairs says that Engine No. 86 on the Cleveland & Pittsburgh road has gone far beyond that. Running freight between Cleveland and Wellsville, making 103 miles a day's work, with 15 cars an average train, No. 86 has run 114,000 miles, has had the valve-seats faced only once, and no other repairs except setting out packing and filing main-rod brasses. During all this time the flues have not been touched, nor has any boiler work been done on the engine. And there was not a leak in the boiler and flues when the engine went into shop on Feb. 1 to have the tires closed in to gauge. The same set of wheels were also under the tender the whole time. Our correspondent thinks this record pretty hard to beat, if, indeed, it can be beaten at all.

The engines now on this road (the Cleveland & Pittsburgh) are now all substantially of uniform patterns, most of them having been built in the shops of the road, or else rebuilt so as to make them conform to the designs of Mr. N. E. Chapman, the Master Mechanic of the road. This uniformity enables the shops to keep in store duplicates all ready fitted of those parts most liable to break, so that an engine can be repaired in very short time, and hurried and defective work avoided.

Evils of Break of Gauge.

The *Civil and Military Gazette*, of India, says:

"Appropos of the grain trade, it is a matter to be regretted that the broad-gauge portion of the Punjab Northern State Railway has not been completed. The evils of break of gauge are now being keenly felt and forcibly demonstrated. It is well known that for months past the rolling stock on the line between Lahore and Jhelum has been totally inadequate for the ordinary traffic of the line. The consequence will be that a vast quantity of the grain now being exported to Jummoo, will be sent by road rather than by the railway, which has not sufficient carriage to convey it. Native dealers sending in their produce from Ferozepore and its vicinity in native bullock carts will naturally prefer sending those carts on, to breaking bulk at Lahore, especially as their doing so will involve the detention of their grain for a considerable time at Lahore, and the risks attendant upon such a delay, namely, damage by wet."

Saved by a Mule.

A mule's heels are generally considered rather destructive than otherwise, but the Pittsburgh *Telegraph* tells the following story of an accident which occurred last week on the Port Wayne road, near Lakeville, O.: "Standing between two of the cars, which were loaded with horses and mules, was a brakeman, whose name is not learned. He went down with the wreck, becoming fastened between the cars, under ten feet of water. His weak struggles to release himself were useless, and he concluded that in a few short seconds all would be over. The mules had been kicking pretty lively in the car, and suddenly the brakeman felt the end boards give way. Then he received a tremendous kick on the thigh, which sent him out of his perilous position to the top of the water. Here he spluttered about until a white mule rose up and struck out for the shore. Then the brakeman grasped the animal's tail and was safely carried ashore. His injuries were not so severe but he could be moved home to Crestline. Another mule escaped by the same egress as the first, and the remaining animals perished. The brakeman should certainly purchase that white mule and keep him, for it has never occurred before that a man's life was saved by a mule, and may never again."

Notes.

A train on a Canadian railroad lately ran over a bear, and

now there is trouble about it. The engineer and fireman claim the bear as a wild animal killed by them; the Registrar of the district land office claims it as having been killed on Government land, and a granger living 10 miles off has put in a claim for \$500 damages on the ground that the bear had probably strayed off his land. Meantime the engineer and fireman have the best of it, as they have eaten most of the meat and have got the skin.

A member of the Canadian Parliament from British Columbia wants a clause inserted in all the contracts on the Canadian Pacific road, that no laborer shall be employed on the work whose hair is more than 5½ inches long. This is aimed at the heathen Chinese.

A tramp was pulled off the trucks of a passenger car the other day, and after smilingly submitting to the accustomed kick, turned to the conductor and said: "Old man, you can belt away at me with that mule's head that you carry on the end o' yer leg till you kick me so full o' holes that my hide won't hold sagebrush, but you can't knock the glory out o' me, or keep me from shoutin' over the thought that I'm jist 315 miles ahead o' this grindin' monopoly. I froze to this train at Reno. Whoop!"—*Elko (Nevada) Post*.

An elephant got in a way of a train in India. The brute turned and fled on seeing the engine, but was speedily caught. The buffer beams of the engine being very low, the beast's hind legs were taken from under him, and he was forced to sit down, as it were, with his hindquarters against the smoke-box door, which was red hot. The poor beast managed to keep his fore-feet going, though hustled along faster than ever he had gone in his life before, and in a few minutes the train came to a standstill, and he got away. He moved off the line at the double, uprooted a clump of bamboo, then wreaked dire vengeance on a tree, and was last seen rushing through the jungle, tearing and smashing everything in his way.

OLD AND NEW ROADS.

Alabama & Chattanooga.—The Montgomery (Ala.) *Advertiser* says: "We are informed that through F. Wolfe, the financial agent of the purchasers of the Alabama & Chattanooga Railroad, a large sum of money has been placed at the disposal of Col. Ball, the Superintendent, to repair and improve the road and its equipments; and that important repairs and improvements will be made without delay."

"The foreign holders of the two millions of state bonds, who surrendered these bonds for a conveyance from the state of the railroad lands along the line of that road, were threatened by a bill introduced into the House of Representatives at Washington, with a forfeiture of these lands. But all danger of that sort has been removed by the prompt and efficient steps taken by Gov. Houston and our members of Congress, especially Col. Hewitt, who is on the House Committee on Public Lands."

Atchison & Nebraska.—Preliminary surveys have been begun for an extension of this road from Lincoln, Neb., northward to some point on the Union Pacific.

Atlanta & Charlotte Air Line.—This company has bought a tract of 9½ acres in Atlanta, Ga., for the purpose of erecting shops sufficient for the repair work required on the road.

Baltimore & Ohio.—The compromise tax bill has passed both houses of the Maryland Legislature and requires only the Governor's signature to become a law.

Brotherhood of Locomotive Engineers.—Some time since a number of the engineers on the Central Railroad of New Jersey signed an agreement to withdraw from the Brotherhood, leaving only a very small membership in the divisions on that road. Some of them have since desired to return, it is said, in order to secure their share in the insurance fund, but the remaining members refuse to recognize them and claim to have sole control of the division funds. The members who withdrew, or some of them, have secured counsel and will apply to the Court of Chancery to restrain the division from paying out any money until the question of membership is decided.

Chicago, Clinton, Dubuque & Minnesota.—The following circular has been issued:

"The Clinton & Dubuque, and Dubuque & Minnesota railroad companies, formerly known as the Chicago, Clinton & Dubuque, and Chicago, Dubuque & Minnesota railroads, have been consolidated under the name of the Chicago, Clinton, Dubuque & Minnesota Railroad Company. This consolidation embraces all the line of road between Clinton and La Crosse Junction, heretofore owned and operated by the two companies, and includes the Turkey River Branch.

"The general offices of the company will remain at Dubuque, Iowa, and mileage, freight and ticket balances should be reported and sent to C. M. Carter, Assistant Treasurer, at this place, as heretofore."

Chicago & Lake Huron.—In the United States Circuit Court at Detroit last week the supplemental bill, filed to bring in the Chicago & Northeastern road as subject to the lien of the Port Huron & Lake Michigan mortgage, was dismissed by consent. A final decree of foreclosure and sale was then entered, by the terms of which the amount overdue for coupons and interest on the mortgages foreclosed is \$1,394,310.92. This amount is to be paid within ten days and in default the road is to be sold by a Commissioner at Detroit after advertisement for four weeks. The decree provides that the Port Huron & Lake Michigan road shall be advertised and sold under the original mortgage upon that section, which covers only the line from Port Huron to Flint; that the Peninsular road shall in like manner be sold under the first bonds issued by the original company, which cover the road from Lansing to the Indiana State line; that these roads shall be sold separately, and the proceeds devoted to the payment of the bonds of the individual corporations mentioned, and the surplus, if any, shall await the order of the Court.

It also decreed that the order heretofore granted authorizing ex-Receiver Bancroft to issue his certificates of indebtedness was vacated, providing that the validity of certificates already issued shall not be affected. His accounts and those of the present receiver shall be audited and allowed by the master in chancery.

In the same case on application of Attorney-General Kirchner an order was entered requiring the Receiver to show cause why the railroad should not pay the specific State taxes now due, and aggregating about \$35,000.

Cleveland, Columbus, Cincinnati & Indianapolis.—Notice is given that 29 bonds of the consolidated mortgage have been drawn for redemption in accordance with the terms of the mortgage. They will be paid June 1, on presentation at the office of Drexel, Morgan & Co., New York, or J. S. Morgan & Co., London, and interest on them will cease June 1. The numbers drawn are: 8746, 8861, 4094, 4096, 4180, 4323, 4363, 4364, 4410, 4487, 4792, 4798, 4847, 4982, 5282, 5325, 5336, 5374, 5380, 5402, 5499, 5617, 5787, 5789, 5839, 6021, 6058, 6102, 6118.

Connecticut Valley.—The managers of this road have bought 800 tons of steel rails and 25,000 new ties for much needed renewals. Work has also been begun filling in the high trestle near Cromwell, Conn.

Dakota Northwestern.—A Washington dispatch says: "A bill has been introduced to charter a narrow-gauge railroad from Bismarck, Dakota, to the Black Hills. There have been bills of a similar character introduced before, but this one is remarkable for the names of the incorporators. Judge Josiah G. Abbott, ex-Congressman from Massachusetts and member of the electoral commission; W. G. Fargo, of Buffalo, of the firm of Wells, Fargo & Co.; L. P. Hilliard, of Chicago; Alexander Mitchell, of Milwaukee, the richest man in the Northwest, and ex-Senator Ramsey, of Minnesota, are among the list. The road is to be called the Dakota Southwestern Railway, with its headquarters in Philadelphia. No land grant is asked for, except the right of way and the privilege of using earth and timber from the public lands along the road, for the purposes of construction."

Denver & Rio Grande.—The report of the Treasurer, Mr. R. F. Weitbrecht, gives the following figures for February and the two months ending Feb. 28, for the whole line, 304 miles:

	February.	Two m'ths
Freight	\$38,206.66	\$83,141.83
Passengers, mail and express	16,013.16	31,747.64
Miscellaneous	170.00	301.00
Total	\$54,389.82	\$115,190.57
Expenses	37,442.28	78,483.21
Net earnings	\$17,547.54	\$36,707.36
Gross earnings per mile	180.89	378.92
Net	57.72	120.75
Per cent. of expenses	68.09	68.13

Government business supplied \$1,926.03 of the gross earnings in February. As compared with 1877, when the mileage was 263 miles, the earnings for February show an increase of \$14,808.08, or 36.8 per cent., in gross, and of \$2,112.97, or 13.7 per cent., in net earnings. For the two months there is an increase of \$83,150.57, or 40.4 per cent., in gross, and of \$4,670.10, or 14.6 per cent., in net earnings.

Eastern Shore.—It is announced that the coupons on the first-mortgage bonds, which matured Jan. 1, and were not then paid, will be paid April 1, at the Girard Bank in Philadelphia.

Erie.—A number of decisions were given last week on the motions in the complicated litigation now in progress. The application of McHenry and others to be made parties in the foreclosure suit was denied, the Court holding that the parties have sufficient remedy in other suits now in progress. The application of De Betz and other foreign holders of second consolidated bonds to be made parties was granted, subject to their proving their ownership of the bonds they claim to hold.

The petition of Isaac S. Fowler, a stockholder, for an order to enable him to examine the books of the company was granted, so far as related to the books and papers in the company's office in New York, with the provision that the examination must be conducted so as not to interfere with the ordinary business of the office. The other orders relate to minor and unimportant matters.

Finally in the De Betz suit the Court granted an order postponing the sale of the road 90 days, until April 24, and appointing Wm. Allen Butler Referee to take proof of the facts alleged by the petitioners and also as to their charges against the Receiver. The order provides that the sale is to take place certainly on April 24, provided a proper stipulation is given by the parties to the suit that the sums found by the Referee to be liens on the property mortgaged shall be deducted from the proceeds of the sale. Should no such stipulation be given, the sale will be subject to further postponement until the Referee's report shall be made.

European & North American.—At a meeting of the bondholders of the Maine section in Bangor, Me., last week, a statement was made showing that the receipts from freight and passenger traffic are fully equal to that of the same period of time last year and that there has been an important saving in the direction of keeping the track and railroad clear. It was resolved to leave to the trustees the question of putting on a second through train.

Georgia.—A strong movement is reported for a change in the management of this company at the annual meeting in May. The stock of the company is largely owned by small holders living on or near the line, and the opposition party has already begun to canvass for votes. Three years ago a similar movement was started, which had considerable strength.

Junction City & Fort Kearney.—The track on this road is laid to Clifton, Kan., 17 miles north by west from the old terminus at Clay Centre, and 50 miles from the junction with the Kansas Pacific at Junction City. The road is controlled and worked by the Kansas Pacific. The original intention was to build from Clifton west to Concordia; but that has probably been abandoned since the Central Branch road has been extended to Concordia and secured the subscriptions voted for the line.

Laurel Fork & Sand Hill.—This short road, which connects the oil wells about Volcano, W. Va., with the Baltimore & Ohio at Laurel Junction, is controlled by the Camden Consolidated Oil Company of Baltimore, a branch of the Standard Oil Company. The oil producers claim that the road has been discriminating heavily against those who do not sell their oil to the Camden Company, and they have secured a charter for a pipe line from Volcano to Petroleum Station on the Baltimore & Ohio.

Leavenworth, Lawrence & Galveston.—In the suit of the State of Kansas against this company, the Receiver of the road has consented to the filing of an order by the United States Court directing him to repair the bridge over the Kansas River at Lawrence and to operate the road to Leavenworth. This is practically an abandonment of the defense of the suit.

Long Island.—Receiver Sharp has made unusual preparations to accommodate the summer travel on this road. Several new trains will be put on and the time shortened as much as possible. Arrangements have also been made to sell commutation tickets for one and three months, as well as for a year, and to sell family tickets, which will be a great convenience for summer residents.

Lycoming County.—Surveys are being made for a railroad from the Northern Central at Minnequa, Pa., west by south to a point in Pine township, Lycoming County, a distance of about 33 miles. The object is to reach a large tract of coal land owned by some parties in Boston.

Michigan Lumber Railroads.—Owing to the absence of snow last winter and the impossibility of sledging logs, there will be a considerable mileage of light railroads built this season in the Michigan pineries. Most of these roads will be short, and nearly all of them will be temporary in their nature, and the track will be taken up when the occa-

sion for their use is past. A few of them, however, may remain permanently, or at least for some years.

A Grand Rapids correspondent of the *Northwestern Lumberman* says: "Quite recently the Cleveland (O.) house of Condit & Co., iron merchants, secured in this city, through the agency of L. H. Kellogg, a contract with the lumber firm of Beldler Brothers, of Chicago and Muskegon, Mich., for a sufficient quantity of T rail (weighing 20 pounds to the yard) to iron a log road seven miles long. Other roads are in contemplation upon which locomotives will be placed, while many are already under weigh for horse cars. Every machine shop in the city is filled with work for these roads, and log cars are accumulating at all their shops. Common log trucks are daily seen hauled through the streets for shipment."

Missouri River, Fort Scott & Gulf.—The following circular is dated at Kansas City, Mo., March 18, 1878, and signed by George H. Nettleton, Receiver:

"By an order of the Circuit Court of the United States for the District of Kansas, made March 16, 1878, the undersigned was appointed Receiver, and has qualified and taken possession of all the railroad and other property of the Missouri River, Fort Scott & Gulf Railroad Company.

"By such order of appointment I am authorized and directed to make sales of the lands of the Missouri River, Fort Scott & Gulf Railroad Company, and to execute contract or deeds therefor jointly with the officers of the railroad company who have been heretofore accustomed to execute such instruments.

"Gen. John A. Clark, of Fort Scott, Kansas, will act as Land Commissioner, and is fully authorized to act for the Receiver in all matters pertaining to the sale of lands, and to receive and receipt for payments upon lands heretofore sold by the Company or by the Receiver."

The company has been in default on its bonds since Jan. 1, 1874, although some partial payments of interest have been made. The road extends from Kansas City, Mo., to Baxter Springs, Kan., 161 miles. The funded debt consists of \$5,000,000 first and \$1,947,000 second-mortgage bonds, all bearing 10 per cent. interest. The bonds are chiefly, we believe, held in and about Boston.

Mobile & Montgomery.—The freight depot of this road at Mobile, Ala., was burned March 23, with a large quantity of freight and 10 cars. The loss is said to be \$75,000.

Montreal, Portland & Boston.—The Court of Appeals at Montreal has decided that 2,300 shares of stock voted on by the Goff party at the late annual meeting were fraudulently issued, and that E. H. Goff and his friends, who claimed to have been elected, are not legal officers of the company.

New Orleans Pacific.—The *New Orleans Times* says: "As the Governor stated in his message to the House, announcing that he had signed the bill granting aid to the New Orleans Pacific Railway Company, that he would not sign the bonds authorized by the act until the constitutionality of the act had been affirmed by the courts, the New Orleans Pacific Railway Company yesterday filed an application in the Fifth District Court for a *mandamus* against the Governor, Auditor and Secretary of State to compel the issuance and signing of the first \$250,000 of the bonds in accordance with the act. The case is fixed for hearing on the 19th inst. Of course the proceedings are entirely of a friendly character, since both parties are anxious to have a decision of the highest court in the State upon the act in question as soon as possible. This case will be decided in the shortest possible time, since the case has a preference over all other cases by a law which was entered a day or two ago."

New York Central & Hudson River.—The *Utica Herald* of March 25 says: "President Vanderbilt, of the Central-Hudson road, has issued an order increasing the hours of labor in the various shops and reducing the force of men in proportion (one-fourth), the order to take effect April 1. The number of men is to be kept down to the lowest possible limit. Employes who have been longest in the service of the company, and particularly those with families, are to have the preference. Masters of shops, engine-houses and other establishments of the company are ordered to see that no unemployed man is permitted to frequent such places or to lounge around among the men. The force to be retained must be efficient and ready for duty at all times and to labor in all things to further the interests of the company. Preparations are now being made to carry the order into effect."

New York, New Haven & Hartford.—This company has agreed to put up on its wharf in New Haven, Conn., hoisting works sufficient to unload 1,000 tons of coal a day, and the Philadelphia & Reading Coal & Iron Company agrees to deliver there at least 60,000 tons of coal a year.

Ohio River.—This company was organized at a meeting held in Ironton, O., March 20, to build a road from Portsmouth up the Ohio River to a point opposite Huntington, W. Va. The distance is about 50 miles by the river, the line of which will probably be followed by the new road.

Olean, Bradford & Warren.—A branch of this road is to be built at once from a point near State Line station, up Knapp's Creek to Duke Centre, N. Y. The distance is four miles.

Owensboro & Nashville.—This company has proposed to the counties of Daviess, McLean, Muhlenburg and Logan in Kentucky, that if their citizens will subscribe \$100,000 stock it will issue to them two shares of stock for each one subscribed by them, and also reduce the present stock of the road from \$2,000,000 to \$1,000,000. With this county aid and the issue of \$200,000 bonds, the company expects to be able to complete the road to Russellville, Ky.

Pennsylvania.—The company's statement for February shows that all lines east of Pittsburgh and Erie show for the month, as compared with 1877, a decrease of \$2,790 in gross earnings; a decrease of \$43,637 in expenses, and an increase of \$40,847 in net earnings. For the two months ending Feb. 28, 1878, as compared with the same period in 1877, there was an increase of \$9,940 in gross earnings; a decrease of \$181,594 in expenses, and an increase of \$191,524 in net earnings. For the two months all lines west of Pittsburgh show a profit, after meeting all liabilities, of \$45,698, as compared with a deficiency of \$105,409 in the same period of 1877.

The adjourned annual meeting in Philadelphia, March 25, was very largely attended. The committee appointed at the previous meeting presented two reports. The majority report, after reviewing the report of the directors very fully, arrives at the following conclusions:

"1. That the management of the road has been intelligent and faithful, and with a continuance of prudent and cautious administration there is no cause for apprehension of disastrous results in the future.

"2. That while your company has been since 1873 and is now suffering in net earnings by reason of low rates, the continued depressed condition of the country and especially from the large amount of guaranteed obligations of other lines, bearing a high rate of interest, incurred during the years of inflation immediately preceding the late panic, yet

encouragement for the future is found in the fact that the tonnage of the main line and all its connections is steadily increasing, giving reasonable ground to anticipate before long an increase of rates; and notwithstanding the extent of the obligations above mentioned they have all been promptly met out of the earnings of your lines, even during the past year of almost unexampled depression and special disasters.

"3. That the policy of the directors, as approved May, 1874, of limiting the extension of the liabilities of the company in leasing new lines, or increasing the guaranteed liabilities either of the Pennsylvania Railroad Company or of the Pennsylvania Company, is hereby approved, and should be strictly adhered to.

"4. That the interests of the company require on the part of the managers the strictest economy, as well in the employment of officers and other labor as in the purchase of property, straightening the track, erection of buildings or other improvements not absolutely necessary to the economical administration of the road, and recommend the sale of any property that may not be required for the current business of the company.

"5. That the net profits of the company be applied to the reduction of the floating debt as rapidly as the board of directors may deem advisable for the interests of the company.

"6. From the dividends to be declared from the net profits of the company, an amount not exceeding 3 per cent. per annum on the capital stock of the Pennsylvania Railroad Company should be invested in a trust 'having for its object the purchase from time to time of the bonds and shares of other companies which are guaranteed by the Pennsylvania Railroad Company, and also of the bonded debt of the Pennsylvania Company,' in such form as the directors shall deem for the best interests of the stockholders and the future prosperity of the company."

The report then closes with a resolution recommending the trust scheme, and suggesting that the stockholders vote on the proposition to-day.

The minority report, signed only by Mr. Thomas Potter, agrees with the majority in everything except the immediate setting up of the trust scheme, "which may involve 2 per cent. of the yearly dividends, amounting annually to \$1,377,404, and extending over an untold number of years, until the \$180,516,293.11 of guaranteed liabilities are absorbed in said trust, without giving the whole body of stockholders ample time to consider the subject which they are asked to vote upon." Mr. Potter suggested in his report that the whole matter be left open for a year, for the reasons:

"1. Because sufficient time has not been afforded to the stockholders of the Pennsylvania Railroad Company to understand the details of this funding trust.

"2. The board of directors of the Pennsylvania Railroad Company are themselves divided in opinion on the subject of said trust.

"3. The financial condition of the Pennsylvania Railroad Company is not such as to warrant any appropriation of the net earnings during the present year to such a fund.

"4. The first duty of the directors of the Pennsylvania Railroad Company is to pay to the stockholders a dividend out of the net earnings of the company.

"5. The funding scheme is of too much importance, involves too many interests and affects the savings of the industrious poor to such an extent that no hasty action upon it can be justified."

A very sharp, and at some points very personal discussion followed, the principal speakers in opposition to the present management being Mr. Daniel Dougherty, of Philadelphia, and Gen. Lemuel Todd, of Carlisle. The chief points of attack were the New Jersey and other leases, and the alleged extravagance of management and undue favoritism. Other speakers defended the management and expressed their confidence in it. It was finally resolved to take a vote upon the two propositions made by the committee at the annual election the next day.

At the election, March 26, the regular ticket nominated by the committee was elected, some of the directors receiving a unanimous vote, while only two opposition candidates were voted for. The resolution of the majority of the committee, authorizing the creation of the trust as proposed in the annual report, was carried, receiving 375,299 votes, against 105,885 cast for the minority resolution postponing the subject for a year.

Pittsburgh, Cincinnati & St. Louis.—At the recent annual meeting the stockholders voted unanimously to confirm the lease of the Pittsburgh, Wheeling & Kentucky road, as agreed upon by the board.

Port Huron & Northwestern.—It is stated that sufficient subscriptions have been secured along the line to grade bridge and tie this projected road from Port Huron, Mich., north by west to Port Austin, about 90 miles. Nearly all the right of way has been given by the owners of the land.

Powell's Valley.—Surveys have lately been begun for a narrow-gauge road from the Knoxville & Ohio at Careyville, Tenn., northeast up the valley of Powell's River to a point near Cumberland Gap. The distance is about 40 miles, through a very fertile country, which is already well settled.

Rochester & State Line.—Preparations are being made for a considerable business in petroleum over this road as soon as the pipe line from Bradford to Salamanca is completed. Large storage tanks are to be built on the company's land at Salamanca, and all necessary facilities for the business will be provided.

Rock Island & Peoria.—Mr. H. C. Whitridge, Auditor, makes the following statement for February:

Freight earnings.....	\$25,023.84
Passengers	6,265.60
Mail, express, etc.....	1,054.08
Total (\$355 per mile).....	\$32,343.52
Expenses (50.99 per cent.).....	16,484.43
Net earnings (\$174 per mile).....	\$15,859.09

The interest on the outstanding bonds for the month is \$1,250, leaving a surplus of \$14,612.09.

Rome, Watertown & Ogdensburg.—It is announced that the April coupons on the consolidated bonds will not be paid. It is expected that the holders of the bonds will shortly be invited to a conference with the officers of the company. Interest on the prior lien bonds will continue to be paid.

This default is not unexpected, as is shown by the fact that the bonds have been selling as low as 41½. The older part of the road is fairly profitable, but for several years it has been working a good deal of new road with very light traffic and the net earnings have been less than the interest charges.

Scioto Valley.—Surveys are to be made for a branch from Kingston, O., east through Adelphi and Laurelville to a point in the Hocking Valley coal region. This branch would be about 35 miles long.

Seaboard & Roanoke.—The sixth and last new span of the bridge over the Roanoke River, at Weldon, N. C., has been put up, and the work will soon be completed. The new

portion of the bridge is 840 feet long, of wrought iron, and was built by Clark, Reeves & Co. It replaces a temporary trestle in use since the last fall freshets. There is still 900 feet of the old Howe truss remaining, which was not carried away. This part of the bridge is also to be replaced with iron before long.

Ship Island, Ripley & Kentucky.—The Mississippi Legislature has passed a bill giving this company a large quantity of land belonging to the State, and also granting it the labor of the convicts in the penitentiary. The company is required to begin work on both ends of the line within six months. It has applied to Congress for aid also.

Sioux City & Pacific.—It is said that this company will this season extend its Northwestern Branch from Winer, Neb., westward up the Elkhorn River to Norfolk, about 30 miles.

Sioux City & Pembina.—It is said that arrangements have been completed to extend this road from its present terminus at Portlandville, Ia., up the Sioux valley to Canton, Dak., about 35 miles. The road is worked by the Dakota Southern as a branch, and has the same ownership as that road.

Southeastern, of Canada.—A company has been organized to build a new road from Abercorn, P. Q., to East Richmond, Vt., some four miles, to avoid the use of the Missisquoi & Clyde Rivers road, and enable the Southeastern to run its trains to North Troy again without interruption. All attempts to arrange a compromise between the Southeastern and the Passumpsic companies have failed.

Southwestern Rate Association.—At a meeting of the Chicago roads held in Chicago, March 22, a combination was agreed upon for the Missouri River and Kansas traffic, which means that they will act together as against the St. Louis roads, and not compete with each other. John Crampton, who has been agent of the old Association at Kansas City, was appointed agent in charge of east-bound business at Kansas City, and J. W. Midgeley, the Secretary of the old Association, Commissioner of west-bound business from Chicago. The roads represented at the meeting were the Chicago & Alton, Chicago, Burlington & Quincy, Chicago, Rock Island & Pacific, Kansas City, St. Joseph & Council Bluffs, and Hannibal & St. Joseph.

Springfield, Jackson & Pomeroy.—Work is now actively in progress on the extension of this road from Washington Court House, O., south by east to Greenfield. The grading is about done and track is laid some six miles from Washington.

Springfield & Northwestern.—It is said that the parties who bought this road at the recent foreclosure sale are trying to negotiate for a transfer of the property to the Wabash Company. The officers of that company recently made an inspection of the road.

Standard Oil Company.—Judge McJunkin, of the Butler (Pa.) Circuit Court, has denied the application made on behalf of this company to remove the suit of Taylor, Satterfield & Co., against the company to the United States Court. Counsel for the company will now apply to the United States Circuit Court for an order removing the case.

St. Louis & Southeastern.—The Auditor's report for February is as follows:

	St. Louis	Kentucky	Tenn.	Entire
	Div.	Div.	Div.	line.
Earnings.....	\$43,841.30	\$26,550.10	\$12,333.53	\$82,725.02
Expenses.....	37,134.00	20,670.00	9,730.50	67,534.50
Net earnings.....	\$6,707.30	\$5,879.41	\$2,593.04	\$15,183.65
Per cent. of exps.....	84.39	78.00	79.16	81.67

As compared with 1877 the entire line shows an increase of \$2,960.82, or 3½ per cent., in gross, and of \$3,320.70, or 27½ per cent., in net earnings.

In Louisville, Ky., March 27, the United States Circuit Court granted a decree against the Kentucky Division, formerly the Evansville, Henderson & Nashville road. The decree provides that the road shall be sold to satisfy the first mortgage for \$998,000, unless all arrears are paid up by Oct. 1.

St. Paul & Pacific.—In the suits of Rice, Thompson and others, trustees, against this company, the Supreme Court of Minnesota has granted a motion made on behalf of the trustees to proceed with the consideration of certain appeals taken in the foreclosure suits. Consideration of these appeals and of the suits themselves was suspended in 1875, at the request of all parties in the case, pending the execution of a certain agreement with the bondholders. This agreement having failed, the Court now decides that there is nothing to prevent the further progress of the suits. It further holds that the agreement was never completed or executed so as to be binding on the bondholders or their trustees, and that it cannot be considered any further in the case.

Syracuse, Geneva & Corning.—Work has been begun on the extension of this road from Geneva, N. Y., northward to Lyons on the main line of the New York Central, a distance of about 14 miles. The contractor for the grading is Mr. Jacob Schaub, of Lyons, N. Y., and the work is to be finished by Aug. 1.

Toledo, Peoria & Warsaw.—In the United States Circuit Court at Chicago, March 23, an order was made directing Receiver Hopkins to deposit with the Farmers' Loan & Trust Company, of New York, \$2,275 to pay certain coupons on first-mortgage Eastern Division bonds, which became due before June 1, 1874, and \$3,500 to pay coupons on Western Division bonds which became due before Aug. 1, 1874, such coupons to be paid at their face value, without any interest. It was further ordered that the Receiver deposit with the Farmers' Loan & Trust Company a sum sufficient to pay a dividend of \$21.92 on each first-mortgage Eastern Division bond for \$1,000, and one of \$21.68 on each first-mortgage Western Division bond for \$1,000, such payment to be stamped or endorsed upon the bonds and coupons, or upon the certificates representing bonds deposited, where such certificates have been issued.

United New Jersey.—In the New Jersey Court of Chancery the Longstreet suit to enjoin the lease of the company's property to the Pennsylvania Railroad Company has been finally dismissed, ending the controversy which caused so much excitement among interested parties a few months ago.

Wabash.—This company is in trouble with its passenger conductors, and 20 of them were recently discharged without previous warning. Their places have been in most cases filled by the promotion of other employes. No reason was assigned for the discharge of the conductors.

Western North Carolina, Western Division.—At a recent meeting in Asheville, N. C., it was voted not to accept the offer of Thomas D. Carter to pay \$50,000 for the control of the suits now pending in Florida. It was also voted to instruct counsel for the company to prosecute vigorously the suits to establish and protect the company's title and interest in the Florida Central, and the Jacksonville, Pensacola & Mobile roads.

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St. Louis, Iron Mountain & Southern.

This company owns and works the following lines:

	Miles.
St. Louis, Mo., to Texarkana, Tex.	490.0
Bismarck, Mo. (75 miles south of St. Louis), to Belmont.	120.0
Poplar Bluffs, Mo., to Bird's Point, opposite Cairo, Ill.	71.0
Mineral Point, Mo., to Potosi.	3.5
Total.	684.5

The main line connects at Texarkana with the Texas system of roads; the Belmont line connects by ferry across the Mississippi with the Mobile & Ohio and the Southern system of roads, and the Cairo line, also by ferry, with the roads terminating at Cairo. The Belmont line was originally the main line, and to accommodate the Southern business the road was made of 5 feet gauge, but the Texas line is now the principal branch of the road and brings it its most important traffic. The report is for the year ending Dec. 31, 1877.

The equipment consists of 118 engines; 46 passenger, 1 sleeping (and a half interest in 7 Pullman cars), and 23 baggage, mail and express cars; 607 box, 446 Green Line box, 445 stock, 1,093 flat and 44 caboose cars; 1 directors' and 5 wrecking and other service cars.

The general account of assets and liabilities at the close of the year was as follows:

Stock (\$31,368 per mile)	\$21,471,151.00
Bonded debt	\$25,909,000.00
Certificates for deferred coupons	2,265,485.00
Deferred coupons, unfunded	174,640.00
Accrued interest on bonds and certificates	1,328,701.25
Total bond liabilities (\$43,357 per mile)	29,677,826.25
Bills payable	324,918.60
Accounts audited, pay-rolls and pay-checks	409,863.02
Total liabilities (\$75,798 per mile)	\$51,883,760.87
Construction and equipment (\$65,084 per mile)	\$44,960,735.04
Real estate	753,581.83
Land grant	3,742,908.46
Land notes and commissioners' accounts	503,431.80
Union Trust Co.	47,813.39
Uncollected earnings, bills receivable, etc.	309,367.89
Supplies and materials	241,382.55
Cash	208,458.35
Excess of liabilities	\$916,081.56

Changes in liabilities during the year were a decrease of \$39,102 in stock; an increase of \$1,112,000 in bonds; an increase of \$972,587.50 in deferred coupons and accrued interest, and a decrease of \$1,011,729.04 in floating liabilities.

The earnings for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Freight	\$3,208,749.84	\$2,842,761.51	I. \$365,988.33	12.9
Passengers	1,108,668.22	974,062.18	I. 134,606.04	13.8
Express and mails	148,722.39	158,046.39	D. 9,324.00	5.2
Miscellaneous	34,282.21	27,175.04	I. 7,107.17	26.1
Total	\$4,500,422.66	\$4,002,045.12	I. \$498,377.54	12.5
Working and general expenses	2,368,520.95	2,518,390.62	D. 149,878.67	6.0
Net earnings	\$2,131,901.71	\$1,483,654.50	I. \$648,256.21	43.7
Gross earn. per mile	6,574.76	5,846.66	I. 728.10	12.5
Net earn. per mile	3,114.54	2,167.49	I. 947.05	43.7
Per cent. of expenses	52.63	62.93	D. 10.30	16.4

The statement of results for the year if all the interest had been paid is as follows:

Net earnings	\$2,131,901.71
Receipts from Land Department	69,439.80
Total	\$2,201,341.51
Year's interest on bonds	\$1,740,207.50
" " certificates	168,481.25
Interest, exchange and premium	74,308.69
Surplus	\$218,344.07

All the interest was not paid, however, and the actual disbursements from net earnings were as follows:

Net earnings	\$2,131,901.71
Receipts from Land Department	69,439.80
Total	\$2,201,341.51
Interest on bonds and certificates actually paid	\$1,116,336.25
Interest, premium and exchange	74,308.69
Balance	\$1,010,696.57
Balance paid on floating debt	\$513,168.04
Invested in construction, equipment and real estate	333,379.46
Surplus	\$164,149.07

The Land Department reports sales in Arkansas of 32,293 acres of land and town lots for \$158,774.11; in Missouri sales of 3,003 acres and 15 town lots for \$13,152.84. Cash receipts were \$30,744.11 on sales, and \$61,764.31 on deferred payments, \$92,508.42 in all.

The Superintendent reports 130 tons of iron and 2,057 tons steel laid, making 85.46 miles of steel now in the track; 4.57 miles of new sidings were built. Many minor improvements in road and buildings were made. Six new passenger coaches were bought.

The traffic of the road was as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Pass. train mileage	1,777,897	1,339,133	I. 438,764	32.8
Freight	1,312,118	1,139,133	I. 172,985	15.2
Total	3,089,015	2,478,266	I. 610,749	24.7
Locomotive mileage	2,689,002	2,658,358	I. 30,644	1.2
Mileage of pass. cars	4,032,546	3,776,392	I. 256,154	6.8
Mile. of freight cars	27,876,392	25,703,763	I. 2,172,629	8.4
Passengers carried	570,763	615,492	D. 44,729	7.3
Passenger mileage	33,403,029	29,158,441	I. 4,244,588	14.6
Tons freight carried	674,652	611,841	I. 62,811	10.3
Tonnage mileage	162,298,855	138,134,513	I. 24,164,342	17.5
Average pass. train load, number	43.11	38.49	I. 4.62	12.0
Av. freight train load, tons	123.70	121.26	I. 2.44	2.0
Average receipt per pass. train mile	\$1.43	\$1.29	I. \$0.14	10.9
Average receipt per freight train mile	2.45	2.50	D. 0.05	2.0
Average rate per pass. per mile	3.32 cts.	3.36 cts.	D. 0.04 ct.	1.2
Average rate per ton per mile	1.98 "	2.06 "	D. 0.08 "	3.9

The through passenger travel increased, the decrease in numbers coming entirely from the Carondelet local trains. The gain in freight was from local and Texas business, the traffic over the Belmont line falling off and the iron ore business being very much depressed.

President Allen's report refers to the suits brought to secure possession of the road for the bondholders and attributes to them the necessity for the sale of 1,118 consolidated bonds at 40 cents in order to satisfy floating debt claims which were pressed on account of these suits. He refers also to the proposition made to the bondholders in August last, and its rejection, and says further:

"A movement was inaugurated to raise money, by assessment of 4 per cent. on the stock, to pay off the arrears of interest, to take effect when 70 per cent. of the stock shall have assented. It is hoped that this scheme will be so far successful as to enable the company to free itself of the serious embarrassments caused by the persistent attempts of one party to force immediate payment of the balance of the half-paid coupons."

He says that the company has continued through the year in good faith the payment of one-half of the accruing coupons. A large part of his report is devoted to a statement of the value of the property and the necessity of united action upon the part of the stockholders to preserve their interest in it. In conclusion he suggests the issue of new bonds at a lower rate of interest, not more than 6 per cent., for the purpose of retiring the present debt and putting the liabilities in a simple and compact form.

Maine Central.

This company owned and operated the following lines for the year ending Dec. 31, 1877:

	Miles.
Portland, Me., by Augusta to Bangor	136.5
Cumberland Junction by Lewiston to Waterville	73.0
Brunswick to Lewiston	23.0
Brunswick to Bath	9.0
Crowley by Leeds Junction to Farmington	47.0
Waterville to Skowhegan	19.0

Total owned	307.5
Belfast & Moosehead Lake R. R., leased	33.5
Newport & Dexter R. R., leased	14.0

The equipment consists of 59 engines; 19 snow-plows; 56 passenger and 26 mail and baggage cars; 701 box, hay and stock, 529 flat and 23 conductors' saloon cars. The passenger equipment is supplied with air brakes and Miller platforms. Two engines, 1 snow-plow, 2 baggage, 2 conductors' and 32 box cars were added during the year.

The general account at the close of the year was as follows:

Stock (\$11,718 per mile)	\$3,603,300.00
Bonded debt (\$28,312 per mile)	8,708,011.06
Interest scrip	27,492.00
Stocks, advances, notes and balances due	13,700.00
Accounts and balances due	29,813.44
Profit and loss	479,130.45

Total (\$41,874 per mile) \$12,876,246.95

Construction and equipment (\$37,935 per mile)	\$11,064,972.78
Androscoquin lease	768,333.33
Stocks, advances, notes and balances due	171,493.87
Fuel and materials	158,785.91
Cash	112,661.06

The bonded debt consists of \$2,353,600 old bonds; \$1,395,811.06 Portland & Kennebec bonds; \$425,000 Androscoquin (city of Bath) loan; \$733,000 Leeds & Farmington loan, and \$3,898,600 consolidated bonds. During the year the entire floating debt was funded in consolidated bonds, as shown in the income account below. The earnings for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Passengers	\$668,056.37	\$769,657.07	D. \$1,090.70	10.6
Freight	\$33,540.59	\$36,028.21	D. 2,487.62	0.3
Mail, express, etc.	98,492.39	90,701.86	I. 7,790.53	8.6
Car use	28,085.60	30,110.37	D. 2,024.77	6.7
Miscellaneous	9,062.05	5,435.72	I. 3,626.33	11.6
Total	\$1,654,237.00	\$1,731,933.23	D. \$77,696.23	4.5
Expenses	1,003,538.05	1,042,081.74	D. 38,543.69	3.7
Net earnings	\$650,698.95	\$689,851.49	D. \$39,152.54	5.7
Gross earn. per mile	4,659.82	4,878.69	D. 218.87	4.5
Net earn. per mile	1,832.95	1,943.24	D. 110.29	5.6
Per cent. of exps.	60.66	60.17	I. 0.49	0.8

The income account for the year was as follows:

Net earnings	\$650,698.95
Interest	\$549,519.41
Rentals	54,000.00
Balance for the year	\$47,179.54

Net proceeds \$1,011,000 consolidated bonds sold	\$34,950.00
Consolidated bonds exchanged for interest scrip and sale of assets	91,100.00
Due on rentals, dividends, etc.	1,175.00
Balance from 1876, less \$9,777.34 charged off	543,016.95
Total	\$1,541,130.53

Bonds paid	\$59,673.21
Notes payable paid	928,920.32
Interest scrip and Port. & Ken. stock	88,528.00
\$100,000, less discount	34,698.93
Notes receivable and sundry account	8,720.41
European & North American change of gauge	1,100,540.87
Balance at close of year	\$380,589.66

The funding of the large floating debt has been a great relief to the company. The only charges upon the income now are the annual interest on the bonded debt, amounting to \$568,863, and the rentals of the two leased roads, amounting to \$54,000, or \$622,863 in all.

The traffic of the road was as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Train mileage, passenger	498,143	534,446	D. 36,303	6.8
Train mileage, freight	395,159	391,718	I. 3,441	0.9
Train mileage, service	184,762	177,075	I. 7,687	159.9
Total	1,078,064	903,239	I. 174,825	8.1
Passengers carried	611,345	603,199	I. 8,146	11.8
Passenger mileage	22,740,125	25,208,476	D. 2,468,351	9.8
Tons freight carried	380,830	382,942	D. 2,112	0.6
Tonnage mileage	25,030,268	25,029,850	I. 418	...
Av. pass. train load, No.	45.65	47.17	D. 1.52	3.2
Av. freight train load, tons	63.34	63.90	D. 0.56	0.9
Av. rate per pass. per mile	3.03 cts.	3.06 cts.	D. 0.03 ct.	1.0
Av. rate per ton per mile	33.3 cts.	3.34 cts.	D. 0.01 ct.	0.3

The average freight rate appears large, but the chief traffic of the road originates on its own lines, and for a large part of the business there is little or no competition. The average passenger journey in 1877 was 37.80 miles; the average freight haul 65.72 miles.

During the year 503 tons of steel, 1,105 tons of iron rails and 95,677 new ties were laid; 8,294 rails were repaired and

re-laid. There were 18,091 feet new sidings built. Bridge renewals included 276 feet new iron and 623 feet wooden bridging besides large repairs to old structures. Unusual attention was given to clearing out culverts and ditches; several embankments were widened and 650 feet of trestle filled in. The usual repairs and renewals of buildings were made.

The business of the road was conducted without accident and with unusual regularity. Traffic was affected by the general depression in the manufacturing towns, though the freight business was almost exactly the same as last year. The company agreed to advance \$16,666 to aid the European & North American road to change its gauge, expecting to be repaid by the increase of business from that road.

St. Louis, Kansas City & Northern.

For the calendar year 1877 this company worked the following lines:

	Miles.
St. Louis to Harlem Junction, Mo.	265.50
Northern Division, Moberly to Iowa line	87.50
Union Depot Extension, Ferguson to Union Depot, St. Louis	11.00
Glasgow Branch, Salisbury to Glasgow	15.00

Total owned	379.00
Han. & St. Joe., Harlem Junction to Kansas City	9.00
St. Louis & Cedar Rapids, Iowa line to Ottumwa, Ia.	43.25
Boon County & Boonville, Centralia, Mo., to Columbia	22.00
St. Joseph & St. Louis, Lexington to St. Joseph	76.25
Total	150.50

Total worked \$529.50

The general account at the close of the year was as follows, condensed:

Common stock	\$12,000,000.00
Preferred stock	12,000,000.00
Total stock (\$63,325 per mile)	\$24,000,000.00
Bonded debt (\$23,728 per mile)	8,993,000.00
Floating debt, less cash and balances due	917,304.15
Profit and loss, St. Louis & Cedar Rapids stock	538,000.00

Total (\$90,893 per mile)	\$34,448,304.15
Construction accounts (\$85,651 per mile)	\$32,461,847.82
Company's stock held	257,344.00
Stock of St. Charles Bridge and leased lines	889,000.00
Unpaid subscriptions to construction	4,375.00
Profit and loss, preferred stock	152,610.50
Materials and supplies	107,782.34
Balance of income account	575,444.49

The bonded debt consists of \$6,000,000 North Missouri bonds assumed, and \$2,993,000 real estate and railroad mortgage bonds. The construction accounts are made up by \$28,600,000 charged as original cost of road and equipment, \$3,841,144.57 subsequent expenditures for construction, and \$20,708.25 paid on account of Glasgow Branch. Expenditures for construction in 1877 were \$164,060.06, chiefly for new cars.

The earnings for the year were as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Freight	\$2,208,120.50	\$2,164,470.99	I. \$43,649.51	2.0
Passengers	804,319.57	848,028.35	D. 43,708.78	5.2
Mails, express, etc.	134,733.49	131,366.04	I. 3,366.85	2.6
Total	\$3,147,173.56	\$3,143,865.98	I. \$3,307.58	0.1
Expenses	1,896,400.42	1,934,527.29	D. 38,126.87	2.0
Net earnings	\$1,250,773.14	\$1,209,338.69	I. \$41,434.45	3.4
Gross earn. per mile	5,943.65	5,909.74	I. 33.91	0.6
Net earn. per mile	2,362.18	2,307.90	I. 54.28	2.4
Per cent. of exps.	60.25	61.53	D. 1.28	2.1

The business of the road was seriously injured by the high water in the Missouri causing the destruction of the road-bed near Harlem, so that no trains could run to Kansas City for 14 days in all. Some loss was also caused by the strikes in July and August. For the last five months of the year the gross earnings were at the rate of \$3,700,000 per annum.

The income account (condensed) was as follows:

Net earnings	\$1,250,773.14
Rentals and sundry accounts	14,180.17
Total	\$1,264,953.31
Interest on bonds	\$806,176.67
Rentals, tracks, depots and bridges	267,894.27
Repairs, Han. & St. Jo. track	8,062.01
Use of foreign cars and rental of box cars	22,632.77
Sundry small accounts	649.45
Interest, discount, taxes, etc.	196,946.47
Freight earnings, pool account	59,586.41
Surplus for the year	\$103,005.26

Debit balance from 1876 \$600,351.42

Charges accruing prior to 1877 18,008.33

Debit balance Dec. 31, 1877 \$575,444.49

The mileage of engines and cars for the year was as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Locomotive mileage	2,503,948	2,587,730	D. 83,782	3.2
Mileage of passenger train cars	2,455,430	3,017,064	D. 561,634	18.6
Mileage of freight cars, company's	17,842,697	16,256,472	I. 1,586,225	9.8
Mileage of freight cars, foreign	5,749,158	7,388,082	D. 1,638,924	22.2
Total car mileage	23,591,855	23,644,554	D. 52,699	0.2
Cost of locomotive service per mile	17.69 cts.	17.88 cts.	D. 0.19 ct.	1.1
Cost of pass. car repairs per mile	1.78 "	1.78 "	...	...
Cost of freight car repairs per mile	0.42 "	0.37 "	I. 0.05 "	13.5

Renewals included 30.5 miles steel rails, 11.13 miles